TEXTILE WORLD RECORD

APRIL, 1912

Monthly Comment.

Bradford Worsteds for British Soldiers

The English worsted industry is centered in Bradford, which from that fact is often called Worstedopolis. As a result of this concentration it is not difficult to persuade the inhabitants of Bradford of the inherent superiority of worsted fabrics for all classes of consumers. Recently the attention of the Bradford trade has been directed to the fact that practically all the wool goods used for uniforms in the British army are carded woolen. This discrimination against Bradford recently became the subject of a rather earnest discussion before the Bradford Chamber of Commerce, which was reported in the "Yorkshire Observer" as follows:

Duncan G. Law raised the question of War Office contracts. Some articles by Howard Priestman which had appeared in "The Yorkshire Observer" relative to the composition of cloths for Army contracts seemed to have attracted attention in London among the Service men, and "The United Services Gazette" had an article suggesting that it would be a great advantage to the Army if there were more worsted used than woolen, pointing out that a man's topcoat was nothing more than a water carrier instead of a waterproof. He did not know what steps they should take to try to get the War Office to adopt more worsted fabrics, but it seemed strange that out of all the cloths used for various purposes of Army clothing there was only one that could be described as a Bradford cloth. Evidently "The United States Services Gazette" desired that efforts should be made to introduce more worsted, which they thought would wear better and be more adapted for the purpose of the Army.

T. Whiteley observed that the War Office were guided largely by precedent, and continued to use these woolen-made goods, which in many respects were not as durable or useful as those made from worsteds.

Mr. Law said it appeared that all the cloths were made out of very short wool, heavily milled, and there was no ventilation.

Colonel H. A. Foster suggested that samples of the cloths should be obtained which would put them in a better position to discuss the matter.

Colonel G. J. J. Hoffmann pointed out that there were, or should be, about 300,000 Territorials, who were being clothed and equipped through the County Associations. The president of the Chamber was a member of the Territorial Association, and if, with the assistance of a small committee, he could ascertain what the requirements were in regard to clothing, and get the County Association to agree to a slight difference between the cloth supplied today and that which Bradford could supply, it might be possible to prove to the War Office that the cloth which had been adopted for Territorials was better than that which they were using.

The President said he should be glad to make an inquiry immediately and obtain what information he could.

G. Garnett thought that a great deal could be gained by going into the matter, but they must not lose sight of the fact that the cloths used by the War Office were the result of long experience.

A committee, consisting of Colonel Hoffmann, Mr. Law, Mr. Garnett and Mr. Hey were appointed to consult with the President, with power

We have at the Boston office of this magazine a collection of thirty-two wool fabrics used for British army uniforms. These samples were obtained by the Bureau of Manufactures in 1910 at our suggestion. Only one of the thirty-two is an all worsted cloth, and evidently it is to this one that Mr. Law referred as "a Bradford cloth." There are, however, four others which are made with a worsted warp and carded woolen filling.

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Bradford, as represented by Mr. Law, will, however, tolerate no such compromise, but wants Tommy Atkins clothed in wool fabrics having no trace of carded woolen made of "short wool heavily milled." For the information of the Bradford trade we give below the official specifications of the five fabrics made of all or part worsted and used for British army uniforms:

Scarlet Serge No. 1, 56 inches wide, 14 1/2 to 15 ounces, London shrunk. warp, 44 threads, 2-ply worsted. Filling, 68 threads, single worsted. Strength, 250 pounds warp; 430 pounds filling. Elasticity, 2 inches warp; 3 1/2 inches filling.

Scarlet Serge No. 2, 56 inches wide, 14 1/2 to 15 ounces, London shrunk. Warp, 54 threads, 2-ply worsted. Filling, 40 threads, single carded woolen. Strength, 385 pounds warp; 310 pounds filling. Elasticity, 2 inches warp; 2 1/2 inches filling.

Blue Serge, No. 2 thick, 56 inches wide, 22 1/2 to 23 ounces, London shrunk. Warp, 48 to 50 threads, 2-ply worsted. Filling, 48 to 50 threads, single carded woolen. Strength, 350 pounds warp; 310 pounds filling. Elasticity, 2 inches warp, 3 inches filling.

Blue Serge, No. 2 thin, 56 inches wide, 18 1/2 to 19 ounces, London shrunk. Warp, 54 to 56 threads, 2-ply worsted. Filling, 40 to 42 threads, single carded woolen. Strength, 370 pounds warp; 370 pounds filling. Elasticity, 2 inches warp; 2 1/2 inches filling.

Drab Mixed Serge, 56 inches wide, 20 to 21 ounces, London shrunk. Warp, 54 threads, 2-ply worsted. Filling, 46 threads, single carded woolen. Strength, 430 pounds warp; 400 pounds filling. Elasticity, 2 1/2 inches warp, 3 inches filling.

English Yarn Counts

The following extract from the British Board of Trade Journal of February 29, 1912, is a reminder of the fact that in the yarn count based on 840 yards per pound the textile world, with the possible exception of France, possesses a standard that is established wherever cotton is spun or woven:

The Board of Trade are in receipt, through the Foreign Office, of a translation of a circular which the Servian Minister of Finance has addressed to all Servian Customs houses, instructing Customs officers to take the English system of numbering as the basis for all cotton yarns, to verify carefully the numbers marked on imported yarns, and not to permit the introduction of any yarn bearing a number which does not correspond in every respect with the English system of numbering.

In France, as our readers will recall, a system which is not the metric, is used for cotton yarn.

A Cotton Excursion to Egypt

The European Cotton Federation is planning an excursion to the cotton fields of Egypt. In this way they hope to stimulate interest in the growing of Egyptian cotton, and thus bring about an increase in the crop. The object of this visit to Egypt is similar to that which led one hundred and twenty European cotton manufacturers to visit the American cotton belt in the fall of 1907, and it is prompted by similar conditions, a decrease in the supply. A preliminary visit to the Egyptian fields has been made by Arno Schmidt, secretary of the Federation, the following being an extract from his report:

The yield of cotton per acre increases in normal years in the United States and in India, but in Egypt we find of late a continuous falling off. Leaving out of account the unsuitable land which was improperly pressed into service of cotton growing owing to the abnormal demand and the high price, the fact remains that in the case of first-class land in Egypt the fertility has decreased, and also the quality. The well-known Afifi cotton, which may be called the "bread and cheese" quality of Egypt, seems likely to fall in quality to the level of American Middling, and if this should come about the reduction in the financial return to the Egyptian farmers has been estimated at £6,000,000 to £8,000,000. Adding the reduction caused by the undoubted falling off in the yield per acre, there would be a total decline in the value of the Egyptian cotton crop of £10,000,000 a year.

All available means should be used to remedy the evils which exist. Cotton is the staple product of Egypt; it can at any time be converted into ready cash, and the danger which threatens it is sufficient to justify the Egyptian Government in spending large sums of money in combatting the dangers which best it.

The causes of the deterioration of quality are four:

(1) Careless seed selection.

(2) Over cropping. The customary rotation has been reduced from three years to two. It is said that the plants are set in rows much closer together than formerly, while the number of plants in a row has been increased.

(3) Insect pests, especially the cotton worm and the boll worm.

(4) Water-logging of the soil.

It has lately been proved beyond doubt that the raising of the sub-soil water is the most important cause in the falling-off of the yield. The careless seed selection is probably responsible for the deterioration of the quality.

The Cotton Commission made twenty-six recommendations for remedying these evils, and nominated a committee to carry them out. Happily, Lord Kitchener, the Consul-General of Great Britain in Egypt, has had a long acquaintance with

the practical work of cotton growing. His presence in Egypt, and the facts which were elicited by the Cotton Commission, have brought into full light the critical position of affairs, and every Government Department is now using its best efforts to find out the various causes of the decline of the crop, and to introduce a remedy.

For the future the outlook is decidedly hopeful. The shortage of the crop in 1909-10 has caused everyone connected with industry to realize the dangerous position of affairs, and efforts for solving the various problems are being made in all directions. Several schemes are under consideration for extending the area of agricultural land. Lord Kitchener stated that by a scheme which would begin in January he hoped to be able to get in years to come a million acres under cultivation, of which a third or a half would produce cotton. Other land reclamation schemes are spoken of, and we may expect to see every year a slightly larger area under cotton. The recently-established Agricultural Department will no doubt deal energetically with seed distribution, pests, and errors of cultivation, and in conclusion it may be added that although the Afifi cotton has degenerated there are signs of a new and improved quality taking its place.

Foreign Trade in Cotton Goods

In his address before the American Cotton Manufacturers' Association, President Smyth called attention to the gratifying increase in the exports of cotton goods, stating that for the seven months ending Jan. 31, 1912, the exports of cloths amounted to 253,000,000 square yards, as compared with 186,000,000 square yards for the corresponding period of 1911, and 188,000,000 square yards for the same period of 1910. President Smyth also pointed to the fact that a number of important American firms have sent their representatives to foreign countries to study the possibilities for marketing cotton goods. This policy is likely to become general with cotton goods exporters and mills making a specialty of the export trade. The Government has for years been doing good work of this kind for the general benefit of the trade, but the best results can be obtained only when the individual manufacturer or exporter makes a personal study of foreign markets and hustles for his own benefit. Following is a statement of the import and export trade in cotton goods twenty-two years:

EXPORTS AND IMPORTS OF MANUFACTURED COTTONS.

Value in units of $100,000.

Year Ending June 30	Exports — Value.					Imports — Value.							
	Colored.	Uncolored.	Apparel.	Other.	Total.	Colored.	Uncolored.	Apparel	Laces, etc.	Thread.	Knit Goods.	Other.	Total.
1890	29	55	2	14	100	33.7	1.3	3.4	114.5	9	71.5	65.8	299.2
1891	26	98	3	15	137	42.4	1.7	12	105.9	8.6	67.4	59.2	297.2
1892	25	87	4	16	132	45	1.4	12.6	112.5	6.6	58.3	46.7	283.1
1893	28	63	5	22	118	55.4	2.6	16.8	127.4	7.6	68.9	61.8	335.5
1894	38	76	5	24	143	33.8	1	16.6	80.2	3.3	43.6	45	223.5
1895	35	70	5	28	138	54.3	1.2	27.7	116.9	6.6	65.4	59.9	332
1896	34	95	7	32	168	49.2	1.8	26.8	108.8	8.7	61.9	67.1	324.3
1897	48	125	9	29	211	44	2.7	26.3	125.7	6.5	56	83	344.2
1898	41	99	9	25	167	53.1	1.2	10.5	117.7	6.9	40.3	42.9	272.6
1899	52	138	13	30	233	66.5	1.1	10.3	145.5	8.5	43.4	45.3	320.6
1900	48	132	16	37	233	81.6	3.6	12.4	102.1	21	47.3	55.3	413.3
1901	66	76	17	33	192	59.2	2.0	15.3	202.3	17.5	55.0	51.4	402.7
1902	74	185	20	34	313	69.3	.9	16.5	224.5	19 2	53.6	60.4	444.4
1903	84	169	26	30	309	90.1	1.5	22.5	251.1	24.2	61.6	79.6	524.6
1904	54	92	27	34	207	81.4	1.5	25 0	248.4	22.6	60.4	55.6	494.9
1905	73	339	34	35	496	77.9	1.5	23.8	259.1	22	61.5	43.2	409.7
1906	69	363	43	36	510	117.2	2.1	29.1	340.2	26	72.2	43.5	630.3
1907	75	136	47	35	293	127.2	2.8	37.7	397.5	35.8	86 7	39.4	727.1
1908	58	84	47	31	271	120.8	3 4	41.9	346.1	39.2	90.3	52.	693 7
1909	72	145	10	70	297	99.	2.9	27.2	343.7	33.1	69.2	45	620.1
1910	85	113	57	41	296	84.	5.8	38.6	368.2	43.1	64.6	59.3	664.7
1911	105	138	71	77	391	83.3	4.7	39.8	359.2	42 1	41.7	69.5	640.3

Foreign Wool and Wool Goods

The imports of wool and wool goods for 1911 show a marked decrease as compared with 1910, and an even greater falling off from the importations of 1909. Nearly all classes of wool and goods share in the shrinkage, following being the figures for raw wool:

Wool 1909.	Wool 1910.	Wool 1911.
Class 1.	Class 1.	Class 1.
143,801,339 lbs.	84,596,588 lbs.	42,852,502 lbs.
$31,168,481	$21,040,633	$9,616,071
Class 2.	Class 2.	Class 2.
32,109,321 lbs.	17,488,599 lbs.	11,253,858 lbs.
$7,655,157	$4,578,781	$2,871,927
Class 3.	Class 3.	Class 3.
136,220,511 lbs.	78,049,824 lbs.	101,816,150 lbs.
$16,706,728	$10,483,033	$12,991,424
312,131,171 lbs.	180,134,981 lbs.	155,922,510 lbs.
Total	Total	Total
$55,530,366	$36,102,447	$25,479,422

The imports of wool goods for these three years were as follows:

1909.	1910	1911
Carpets and Rugs.		
$4,550,933	$4,148,636	$3,874,295
Clothing.		
$1,639,122	$2,145,651	$2,186,195
Clothes.		
$5,991,086	$5,682,180	$4,692,626
Dress Goods.		
$8,637,286	$8,272,280	$4,502,264
All Others.		
$1,239,684	$1,338,749	$962.498
Total	Total	Total
$22,058,711	$21,587,496	$16,217,833

These import statistics reflect the disturbed state of the woolen and worsted industries during the past three years.

The world's consumption of cotton for the twelve months ending August, 1911, amounted to 17,819,070 bales, of which the United States consumed 4,696,000 bales; Great Britain, 3,384,480 bales; Russia, 1,751,619 bales; Germany, 1,685,192 bales; India, 1,479,803 bales, and Japan, 1,254,078 bales.

SOUTH AMERICAN WOOL

A Report to the Tariff Board by Joseph E. Wing

During the recent investigation of schedule K the Tariff Board sent Joseph E. Wing to South America to study the wool growing industry there. The Board gives the following account of Mr. Wing's mission:

Proceeding direct to Punta Arenas on the Straits of Magellan, a city in Chilean territory, where he obtained valuable data from the great corporation known as the Sociedad Explotodora, an organization growing more than a million sheep, he sailed to Rio Gallegos, exploring the region adjacent to that port, subsequently calling at Santa Cruz, San Julian, Deseado, Rivadavia, and Port Madryn, in the Province of Chubut, thence by rail to Trelew, thence by coach and horse up the Chubut Valley and back to the coast, thence to Port Antonio in Rio Negro, and from there by steamer to Buenos Aires. From the capital he went to Parana, Rosario, Santa Fe, Gualleyguy, Concordia, Corrientes, Resistencia, and south again by Rosario to Buenos Aires. Thence he made various journeys west and south, entering the territory of the Rio Negro and various parts of the Province of Buenos Aires. Subsequently Montevideo and various parts of Uruguay were visited.

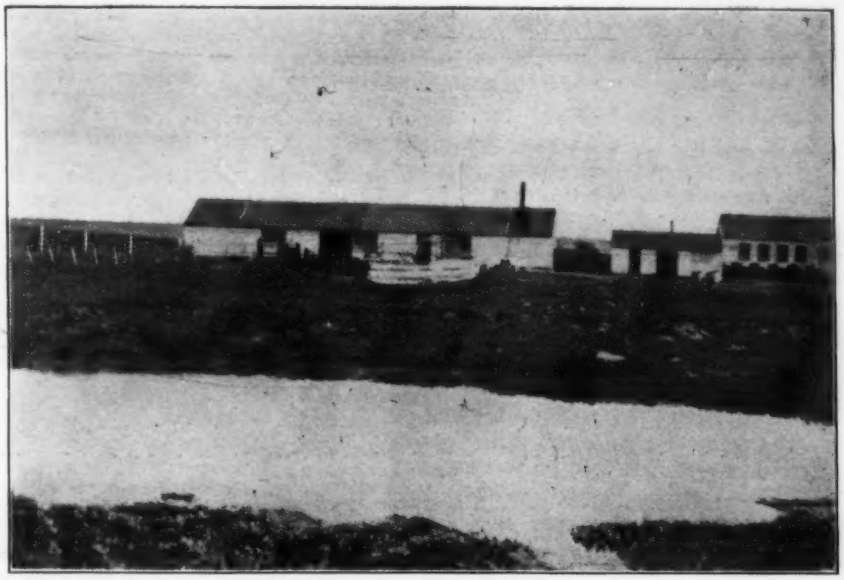
On his return Mr. Wing made a very interesting and instructive report, which is in part as follows:

The island of Tierra del Fuego, one-half of which is Chilean, is one of the best sheep countries in the world. On this island and on the mainland adjacent, in Chilean territory, there exists one of the greatest sheep ranches in the world, and one of the best managed, producing good wool at a low cost and excellent mutton which goes frozen or canned to England. Some details as to the operation of this great property are given elsewhere in this report.

The island has a rich, black soil, often inclined to be peaty; usually abundant rainfall; not enough snow to do harm; and is covered with good close-set, nutritious forage plants, white clover, redtop, and many similar grasses, much as are the best Ohio pastures. All of the island is fully stocked, and has been for many years. The types of sheep seen here are the Romney, the Lincoln, and some few Corriedales (of New Zealand), a cross between Lincoln and merino. Very good but rather coarse wools come from the region along the Straits of Magellan. There is absolutely no handicap to shepherding

here. Wild dogs and a few foxes are the sole destroying animals. The fenced pastures carry their flocks the year around with no extra feeding. Owing to violent winds and cold summers little or no agriculture is practiced. The number of sheep reported in Tierra del Fuego on the Argentine side only is 1,341,351, an almost incredible number for so small a country.

North of the island is the Argentine territory of Santa Cruz. This is a vast region, not yet fully stocked with sheep. Its south and west are well grassed, its north and east are semidesert, yet this region is capable of carrying about 1,200 sheep to the league of about 6,250 acres. At Rio Gallegos one sees fine, fat muttons, and again at the Coyle, with fewer fat sheep as one goes northward. The sheep of this region were originally either Rambouillets from the Rio Negro, or Lincolns from the Falkland Islands. Now many Romney rams are used, and also Lincolns. The wools of Santa Cruz are good wools, clean and strong, but of a somewhat coarse nature, except in the crossbreds, and the merinos of the northern coast lands. It is reasonable to look for a considerable increase in the numbers of sheep in Santa Cruz, though at present much of the land is stocked, and some is overstocked. It is the land back from the coast that is being newly stocked. Transportation is very difficult indeed from the foot of the Andes to the coast, owing to the poor grazing for the oxen and the total absence of any agriculture and the impossibility of purchasing forage. The Santa Cruz River is now being opened to navigation, which should develop a rich grazing region. It is nearly certain that the numbers of sheep and output of wools from Santa Cruz will augment, and perhaps may increase 50 to 100 per cent. According to the census of 1910, there were in Santa Cruz 2,387,566 sheep, and the territory can probably support easily 5,000,000 sheep. To do this will require the erection of many windmills for pumping water, and much fencing.



SHEARING SHEDS AND DIPPING VAT, SOUTH AMERICA.

Chubut and parts of Santa Cruz are to be opened up by new Government railways now under construction, which will enable a great many more sheep to be kept. All of eastern Chubut is practically a desert country, covered thinly with desert shrubs. There is a small amount of nutritious grass

under and between the shrubs. It is almost too poor to pay to fence and stock, yet this is being done on a considerable scale. The Government sells the land usually for $4,400 per league of nearly 6,250 acres. In the back parts of Chubut is a fine grazing country near the base of the Andes. The trouble here is that the bringing down of the wool is difficult. It is estimated that Chubut, which now has about 2,123,628 sheep, could easily double and probably quadruple the numbers. This probably will not be done soon, and the growth will be gradual. The sheep of Chubut are very largely of Rambouillet type, though there are many Lincoln rams used on Rambouillet ewes. The wools of Chubut, while very good, are often heavy with sand, owing to the nature of the soil and the furious winds that often prevail throughout all the Patagonian region.

CROSSBRED ROMNEY SHEEP IN SOUTH AMERICA.

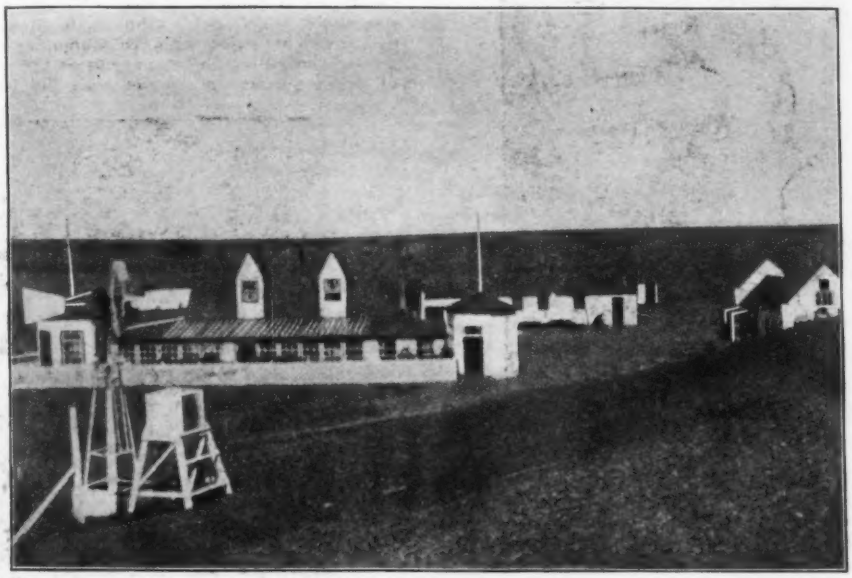
RIO NEGRO

The immense territory of Rio Negro is not heavily stocked with sheep at the present time. Along the rivers and in the west along the mountains are estancias. There are now 4,724,844 sheep in the territory, according to the census of 1910. They are almost universally of Rambouillet blood. The territory is probably capable of carrying several times its present number of sheep, but it awaits transportation facilities, the selling of the land, and fencing, and the advent of American windmills. The Government is now building a railroad into the interior.

The reason for the probably slow development of Rio Negro is to be found in the character of the soil and climate and the limited number of sheep that can be carried to the league. All of Patagonia has been the bed, and later the beach, of the sea. The soil is very thin and rests on coarse gravel or shingle. Probably there is no more immense region in the world of so uniform a character as this. From a little way below Bahia Blanca the shingle beds stretch away nearly to the coast at Punta Arenas. There are alluvial valleys of small extent and occasional mountains that rise above the shingle, but 99 per cent. of the land well toward the mountains is of this character. The rainfall is light and irregular. For example, at the time of this investigation there had been three years without one good rain in the Rio

Negro country. The result is a vegetation of desert nature, sparse grass between the shrubs, scattered bushes of stunted growth, and no trees.

Much of the land of Patagonia is now held at $10,000 per league (nearly 6,250 acres), or $4,400 in Argentine gold. As these desert lands are expensive to water, fence and equip, the margin of profit in sheep farming on that basis might be very small or disappear altogether. Where estancias have been established in these deserts, the brush



A PATAGONIAN ESTANCIA HOUSE.

cleared away about the headquarters, and the wind allowed access to the earth, the sand has sometimes drifted away down to the bare shingle, and corrals and yards are filled with the drifting sand. The wools of the Rio Negro country are good, strong merino wools, but rather heavy with sand.

Neither Chubut, Rio Negro, nor northern Santa Cruz will compete much with the United States in production of mutton in the near future. It is a land of sparse and dry grass, therefore a wool-producing region chiefly, though no doubt many good canning sheep will be produced. Irrigation, too, will in time produce alfalfa in both Rio Negro and Chubut, and this will, no doubt, be fed to sheep.

CORK INSERT PULLEYS

Editor Textile World Record:

I recently criticised a paper singularly inaccurate as to facts and deductions on the relative power transmitting capacity of cast iron, paper, wood and cork insert pulleys, read by Prof. Sawdon of Cornell University before the National Association of Cotton Manufacturers, and, because of the prominence of the authority, copied extensively in trade and technical journals.

In replying Prof. Sawdon fails to explain why his tests show totally different results from those obtained by Prof. Charles M. Allen of the Worcester Polytechnic Institute and George H. Perkins, M. E. of the Lowell Textile School, but, in taking exception to my criticism, calls attention to a few matters of minor importance, to which I reply as follows:

1. I did not include in the report of tests made at the Worcester Polytechnic Institute the tests of the experimental, impracticable and discarded vulcanized fiber pulley, as under the circumstances I considered the results obtained of no value to anyone.

2. Although Prof. Sawdon writes that in my reply I cited but one set of tests, namely, those made at the Lowell Textile School, a reference to the paper which I quote below will show his error, which is quite in accord with some of the other

inaccuracies criticised:—"As the results described therein do not fully accord with those obtained in similar tests made at the Worcester Polytechnic Institute, at the Lowell Textile School and with other pulleys in use under factory conditions, careful consideration and discussion seems desirable in order that we may consider the reasons for the differences referred to and establish the facts in the matter."

3. Replying to his statement that, "The losses between belt and pulley in a practical transmission rarely exceeds about 2 per cent. and are often less," I refer again to his original paper in which we find:—"Many kinds of service demand at times

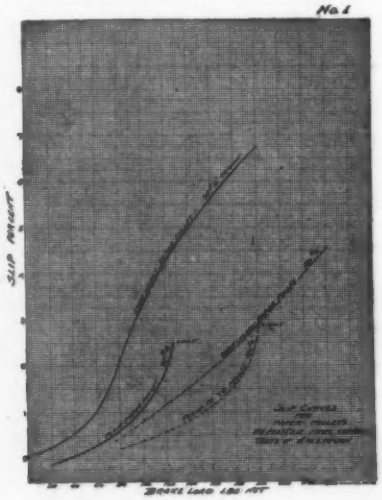


FIG. 1.

overload capacities as much as 50 per cent. of the normal load," and I would like to know if these overloaded drives come within the class referred to in which the slip does not exceed 2 per cent.

4. While it is true that F. W. Taylor recommended a belt tension of 200 to 225 lbs. for use on plain cast iron pulleys upon upright machine tool drives, neither he nor any other engineer will object to a lower belt tension when practicable, and, as bearing on this, it may be of interest to note that Prof. Sawdon's tests were started at a belt tension of 37 1/2 lbs.

If Prof. Sawdon for one cause or another has put over his signature a paper containing glaring inaccuracies and wrong deductions as to the efficiency of cork insert pulleys of standard design and manufacture obtained from tests made by him of improperly equipped pulleys, I should think he would be glad to correct the errors as soon as they have been called to his attention.

Inaccuracies, carelessness in the preparation of and deductions drawn from wrong premises nullify the value of a technical paper, and I had supposed that I had pointed out in the paper in question a sufficient number of these to utterly destroy its value, but, as Prof. Sawdon remains unconvinced, I call attention to some other inaccuracies, which will perhaps explain why and how his results differ from the results obtained by the other authorities above mentioned and by many hundreds of users of these pulleys.

So carelessly were these tests made and summarized that authough the official report states that:—"The cork inserts were 1 1/4 in. in diameter set in 1 1/16 in. diameter sockets and spaced 2 1/4 in. between centers. This gave a cork area of 37 to 39 per cent. of the total pulley face. It is general practice to make the cork area from 25 to 33 1/2 per cent. of the total area," a moment's figuring will show that 1 1/16 in. sockets 2 1/4 in. on centers give an area of less than 21 per cent. instead of 39 per cent. of the total rim area, or but about 55 per cent. of the cork area used in pulleys supplied by this company to its customers.

Equipping pulleys for such a test with but about one-half the required cork area is bad enough, but to allow the corks to project 1/11 and 1/13 in. respectively, which projection tends to prevent the belt from contacting with the remainder of the surface of the pulley and thus reduces the actual area of pulley surface in contact with the belt, is still

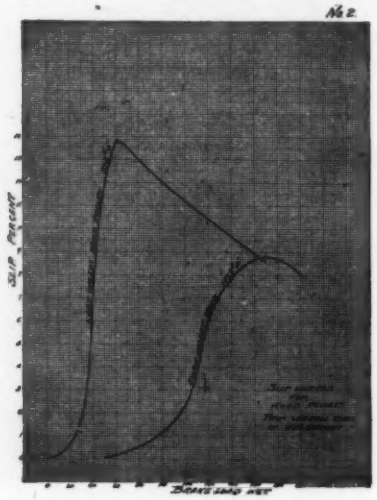


FIG. 2.

more disastrous to correct conclusions, as well as unfair to those who rely on the correctness of the investigator's deductions.

Then again, what shall we think as to the reliability of a paper in which it is stated that:—"Unfortunately in the paper and in the corked pulley tests the capacity of the machine did not permit of high load being carried to determine the maximum values of the coefficient of friction and corresponding slip," when on examining the full report on file with the Association we find from the data sheets and diagrams that no reference is made to the behavior of plain paper pulleys at a slip exceeding 2.8 per cent., whereas the cork insert paper pulleys are carried to loads of nearly double and at slips that reach nearly 7 per cent.—a somewhat surprising circumstance in the light of the above quotation as to the limit of the capacity of the machine? I should like to know why Prof. Sawdon omitted to carry the paper pulley tests beyond the low point at which these tests were apparently stopped and yet carried the cork insert

pulleys to the high point above mentioned.

To make this point clear I herewith present a comparative plot, Fig. 1, on which I have grouped curves taken from separate sheets of the unpublished portion of his original report and which speaks for itself. Then again the cork insert pulleys tested were not only equipped with but about one-half the required area of cork, but the cork was used under but 19 per cent. compression instead of 33 1/3 to 50 per cent. as has been found desirable and is common practice with us. I also submit another diagram, Fig. 2, from his unpublished curves of cork insert wood pulleys at belt tensions of 37 1/2 and 187 1/2 lbs. respectively. This diagram shows that a pulley with a belt tension of 37 1/2 lbs. will lose in efficiency to a point of 14 per cent. slip with a load of 60 lbs. and then gain in efficiency under an increasing load until the slip is but 8.75 per cent. with a load of 180 lbs., at which point the pulley with a belt tension of but 37 1/2 lbs. will equal in efficiency a pulley operating under a belt tension of 187 1/2 lbs.—a result that seems as improbable as it is different from those obtained by others.

While I disliked to start a possible controversy by criticising the original report, I could not allow to pass unchallenged a paper which contained the above mentioned inaccuracies and that showed that if a drive equipped with plain cast iron pulleys of given dimensions operating at 2 per cent. of slip and at normal belt tension and speed transmitting say 20 h. p. was changed by the removal of the cast iron pulleys and the installation of plain paper pulleys of the same dimensions and operating at like speed, slip and belt tension, the drive thus altered would then transmit 152 per cent. additional power or, in other words, more than 50 h. p., when the other tests show Rockwood paper pulleys to be only some 35 per cent. more efficient than plain cast iron and wood pulleys and that cork insert pulleys, whether of paper, wood or iron, are from 50 to 52 per cent. more efficient than plain cast iron or wood pulleys and at least 15 per cent. more efficient than Rockwood paper pulleys.

As a side light on this claim of Prof. Sawdon that Rockwood plain paper pulleys are 152 per cent. more efficient than cast iron pulleys, we submit the following quotation from a letter of the Rockwood Company dated Mar. 17, 1911: "We claim an increased efficiency of 25 to 35 per cent. when the wear of the belts are the same for each set of pulleys; at the same time the paper pulley will undoubtedly transmit from 50 to 55 per cent. more power than the cast iron pulley if we disregard like conditions of wear of the belt."

We trust that those who read this article will give it the same careful consideration given the letter by Prof. Sawdon which has made it necessary.

The Cork Insert Company,
Lawrence Whitcomb,
Treasurer.

WOOL SALES, OLD AND NEW

A wool sale in 1812 was in striking contrast to the proceedings at a wool auction in 1912. It is hard to realize that a hundred years ago wool was sold "by the candle"—that is, the bidding on each lot of wool lasted while an inch of candle was burned, and the successful competitor was he whose bid was last before the candle went out. The scene of these remarkable sales was Garraway's Coffee House, Change Alley, Cornhill, London. The sales lasted for an hour a day, and the lots were nearly all single bales, the whole turnover being comparatively insignificant. Later on the candle method gave way to ordinary auctions, but they were small and slow compared with present-day proceedings.

The wool sale of 1912 is a frightfully strenuous affair. Buyers representing all nationalities shriek, wail, and throw their arms about, a wildly gesticulating mass of animated humanity, acting like madmen. All is rush and bustle and excitement, and the sale of thousands of pounds' worth of wool is rushed through. The strain mentally and physically on buyers is great—few can stand it for many years, and frequently there is a case of a breakdown. But those who are left shriek themselves hoarse, strain their lungs, and physically wreck themselves. A vast change this to old-time sales, but is it a sensible change after all? Expedition is all very well, but could it not be secured with less strain on buyer and seller?

The wool sale of 2012 will probably be a vastly different affair. Long before that time common sense will have prevailed, and a system of tendering will have taken the place of wool auctions. That the system is possible is already proved, for large quantities of scoured wool are now dealt with successfully by tender. The wool will probably still be shown in commodious stores, and examined by buyers in the usual careful way, but instead of shouting, shrieking, and gesticulating in the auction-room for two hours he will send in his price for each lot in the catalogue which meets his requirements, and the highest bidder will have the wool, and in the course of the afternoon a printed list could be issued to buyers, showing the successful tenderers.—Textile Mercury.

The Tariff Board's Report on the Cotton Schedule

Following is a summary of the leading features of the Tariff Board's report on the cotton schedule:

Cost of raw material is the same in the United States and abroad.

Foreign cost of Spinning medium and coarse cotton yarn is about 70 per cent of domestic cost.

English labor cost of manufacturing yarn is seven-eighths of the cost in the United States.

Duty on medium and coarse cotton yarn is two or three times in excess of difference in cost of production.

Duty on the finest yarns is about equal to the difference in the cost of production.

Cost of weaving many plain cotton cloths is lower in the United States than abroad.

These plain cloths are sold by the manufacturer at as low a price in the United States as they are abroad.

Cost of weaving fancy cottons is higher in the United States.

Duty on fancy cottons is in excess of difference in cost, and in some cases is greater than the total conversion cost in the United States.

Costs vary more from mill to mill in the United States than in England.

Wages are well standardized in Lancashire, but vary widely in the United States.

The English mills visited were of modern type; some of the American mills were old and of low efficiency.

The duties imposed to protect difference in cost of finishing processes are in many cases greater than the total American cost of such processes.

The English consumer buys cotton goods for less than does the American consumer because there is less profit in England between the mill and the consumer.

The American system of " set prices " is responsible for much of the increase of cost of cotton goods to the ultimate consumer.

The President in his message transmitting the report to Congress recommends a prompt revision of the cotton schedule on the basis of the difference between the domestic and foreign cost of production. The report is in part as follows:

The method of determining costs adopted by the board does not include the item of interest, so that the cost figures as given show nothing regarding the original investment necessary to carry on the process of manufacture except the item of depreciation. This item is slight so far as cost per yard of cloth is concerned. Obviously, however, the relative advantage or disadvantage of foreign and domestic manufacturers in competition is affected by amount of original capital on which interest must be earned. Consequently figures are presented showing the relative costs of completing and equipping a spinning plant and a weaving plant in England and this country designed to carry on the same line of production. From these figures it appears that the cost of erecting a building is about 40 per cent. greater in this country than in England, the cost of equipment for a spinning mill about 70 per cent. higher, and the cost of equipment for a weaving plant (with plain looms in both countries) about 50 per cent. higher. These figures are for the equipment considered adequate for a given production in the two countries. It varies somewhat according to different methods prevailing in the two countries, and the figures do not necessarily establish the relative prices of identical machines here and abroad. Where a mill is equipped with automatic looms the cost of the looms is at least two and a half times the cost for a mill equipped with plain looms.

A very small part of the cotton machinery used in this country is imported, a marked contrast to the case of worsted machinery. With the exception of spinning mules, more than 90 per cent. of the machinery is of domestic manufacture. Practically all looms and all ring spindles are of domestic make. Of cards and jack spindles about 15 per

cent. are of foreign make. Mule spinning in this country involves only about 20 per cent. of the total number of spindles and of the mules in use in the mills investigated 83 per cent. were imported.

COST OF YARNS

In comparing the cost of making yarns in England and the United States it has seemed essential, in view of the fact that 80 per cent. of English spindles are on mules and 80 per cent. of American spindles on ring frames, to compare the cost of mule spinning in England with the cost of ring spinning in this country. As a rule, mule spinning is a more expensive process, and the production from mule spinning is of somewhat finer quality, even with yarns of the same nominal count. These facts should be kept in mind; but it is evident that the really significant comparison is that between the actual results obtained under the prevailing methods of each country.

In the cost of raw material there is practically no advantage possessed by either country. Any general difference in the price between England and the United States is less than occurs from mill to mill or month to month in either country.

The actual book figures for English mills and the American mills show that in comparing the most efficient mill for which we have figures in England with the most efficient mill for which we have figures in this country—and these mills are typical in both cases—the per cent. of the total English labor cost to the total American labor cost per pound of yarn varies from 78 to 95 per cent. Comparing all of the yarns selected, the English labor cost is found on the average to be practically seven-eighths of the American in the case of these two mills.

In the matter of general expense the difference between the two countries is decidedly greater, thereby increasing the difference in the total conversion cost of yarn. Again, by comparing the two most efficient mills, as referred to above, it is found that the total conversion cost of yarn in England varied from 65 to 79 per cent. of the American conversion cost. The average on all counts taken shows the English conversion cost to be 72.6 per cent. of the American.

It should be noted that these comparisons are based upon taking that mill in each country which showed in general the low cost on the whole range of yarns. On certain particular counts a lower cost was shown in other mills, so that the figures may be taken as typical for mills of high efficiency. They cover warp and filling yarns not higher than 50s for warp and 70s for filling.

Taking all the mills covered by the investigation in each country, there are wider variations in the American costs secured than in the English costs, due partly to the fact that the English mills were all in the Manchester district, where wages and other conditions are well standardized, while the American costs were taken from mills covering a much wider area, with much greater difference in labor and other conditions. Another reason for the wider variations in American costs is that the English mills for which figures were secured are all of modern and efficient type, while some of the American mills included were old and of low efficiency.

In the case of most yarns for which figures are given for the United States the highest conversion cost is 50 per cent. higher than the lowest conversion cost. In a few cases it is nearly double. Consequently the difference in conversion cost would appear much greater in a comparison drawn between mills of lowest cost in England and mills of highest cost in the United States.

In this connection care should be taken not to confuse converson cost with the value of the finished yarn. In saying that the cost of manufacturing yarn in an English mill is 72 per cent. of the cost in an American mill, it is not meant that the total cost of English yarn, including the value of the cotton in it, is 72 per cent. of the total cost of the American yarn. As a matter of fact, the difference in conversion cost between the two countries varies from 3.8 to 11.9 per cent. of the total cost of production in England, including raw material.

It should also be noted that these relative costs do not include yarns of the highest counts or other yarns used largely for special purposes, since the board was not able to secure sufficiently detailed figures on the higher counts abroad. They do include, however, the great mass commonly manufactured in the United States. It is entirely possible that a comparison of costs on these special counts or qualities would show a different ratio between the two countries than is here presented.

DUTIES ON YARN

In comparing duties with costs of production the report presents two separate sets of figures—one referring to the ordinary warp and filling yarns manufactured by weaving mills for their own use, and the other referring to costs on certain grades of yarn produced by mills which do only a spinning business and sell the yarn as their finished product. These latter figures include a few warp and filling yarns, but cover primarily knitting yarns or yarns used for specialties.

A comparison of the cost of production in the two countries shows that in the case of the ordinary warp and filling yarns the present duty is regularly in excess of the difference in cost of conversion. If the relative costs only of the two mills having the lowest cost of production are considered, it appears that the present duty on the types of warp and filling described, ranging from 30s to 80s, is in all cases more than twice the difference in the total conversion cost, and in some cases four or five times the difference. The labor cost on these yarns is from 50 to 60 per cent. of the total conversion cost.

These figures, as stated, are based on the difference in conversion cost between the two mills of lowest cost. Making, however, a similar comparison between the lowest cost in England and the highest cost in the United States, in practically all cases the duty is greater than the difference in the conversion cost. For example, taking a 40s warp, the lowest American conversion cost is 8.4 cents, the highest 11.25; the lowest English cost is 5.8 cents, and the duty is 10 cents per pound.

For the other class of yarns referred to above

it is not possible to present detailed figures of English costs. However, since the general ratio of the English costs to the American costs in yarn making has already been shown, an interesting comparison can be made between the duty on these yarns and the total conversion cost in the United States. It is obviously true that if the purpose is to compare duties with the difference in the cost of production here and abroad, this comparison can be made if we have the general ratio of foreign cost to the domestic and the ratio of the duty to the domestic conversion cost. Thus, if the English conversion cost is 50 per cent. of the American conversion cost then a duty which is 50 per cent. of the American conversion cost would offset the difference in cost of production. Or, if the English cost is 70 per cent. of the American cost, this difference would then be offset by a duty which is 30 per cent. of the American cost. The second set of yarn cost figures show, like the first, that in the case of low-count yarns the duty is largely in excess of the difference in cost of conversion. On some of the lower counts the duty is equal to or greater than the total cost of conversion in the United States. On yarn in the gray from 50s to 80s the duty ranges from 44 to 70 per cent. of the total conversion or manufacturing cost, and generally it is greater than the labor cost in the United States. Comparing these figures with the figures showing the general ratio of manufacturing cost in England to that in this country it appears that on such yarns the duty is regularly in excess of the difference in cost of conversion.

A somewhat different situation appears in the case of yarns of this character which are of higher counts—on two-ply yarns and in the case of bleached, mercerized and dyed yarns. For such yarns the ratio of the duty to the American conversion cost is decidedly less, ranging from 30 to 45 per cent. A duty which is 30 per cent. of the American conversion cost would offset the difference in cost when the English conversion cost is 70 per cent. of the American. A duty of 45 per cent. is in excess of the difference in cost unless applied to yarn on which the English cost of manufacture is only 55 per cent. of the American. On single-ply, mercerized yarns, 60s to 80s, the duty is about 31 per cent. of the American manufacturing cost, while on two-ply mercerized yarns it ranges from 35 to 45 per cent. of the American cost.

COST OF WEAVING

In the matter of turning yarn into woven fabrics the board was unable to secure such detailed foreign-cost figures as in the case of spinning, and the relative cost of this process of manufacture here and abroad cannot be stated in the same way. For tariff purposes, however, valuable conclusions may be drawn from a comparison of relative prices under competitive conditions in this and other countries and from a comparison of duties with domestic production costs. These are considered below.

It is necessary, however, to recognize an important difference in the methods employed in the United States and England in this branch of the industry. There seems to be no wide difference between the two countries in the amount of machinery tended or in the output per operative in the spinning of yarn. In the case of weaving the situation is quite different. English looms run somewhat faster than the looms in this country, but the number of looms tended per weaver is usually much less than here. This is in marked contrast to the woolen industry, where the number of looms tended is about the same in the two countries. In the case of plain looms (not automatic) the English weaver seldom tends more than four looms, while in this country a weaver rarely tends less than six, and more frequently eight, or even 12, if equipped with "warp-stop motions." Furthermore, English manufacturers make little use of automatic looms, of which there were less than 6,000 in May, 1911, in the whole of England, while in the United States there are well over 200,000. It is estimated that there are now about 10,000 of these looms in use in England and about 15,000 on the Continent. Where automatic looms can be used a single weaver commonly tends 20 looms, and sometimes as many as 28. The result is that whereas the output per spinner per hour in England is probably as great or greater than in this country, the output per weaver per hour is, upon a large class of plain goods, less, and in the case where automatic looms are used in this country and plain looms in England, it is very much less.

The foregoing statements apply to a comparison of plain looms in the two countries or of plain looms in England with automatic looms here. In the case of other methods of weaving, such as dobby, Jacquard, box dobby, box Jacquard, lappet, etc., the difference in output is by no means so great. In the case of dobby looms (without automatic attachment) on some classes of fabric, the American weaver will tend eight or more looms as against four in England; but with the more complicated weaves the ratio seems to be nearer that of six to four, and, in the case of certain fancy fabrics, where the number of looms tended is necessarily four or less, the output per weaver is about the same in both countries.

As is well known, wages or earnings are not necessarily an index of the labor cost of any particular process of manufacture. The labor cost per yard depends on the relation between wages and output. An extreme illustration can be shown by figures secured by the board in Japan. It is true that the wages of spinners and weavers per day in that country are very low, but the number of operatives employed to secure a given output is much greater than in this country. In the case of spinning, the lower wages paid are not offset by the larger number of persons employed, and consequently the amount paid to spinners per pound of yarn is materially less than in this country. On the other hand, Japanese weavers tend only one or two looms, and the lower output per weaver under existing conditions makes the amount paid the weaver per yard of cloth about 80 per cent. of the amount paid in this country where plain looms are used in this country; while compared with the use of automatic looms, the amount paid the weaver per yard of cloth is greater than in this country.

It must further be noted, however, that the cost of weaving is not merely a question of what the

weaver receives per yard. The ratio of other labor to weaver's labor varies greatly from mill to mill and no general statement can be made regarding it. The cost of this other labor, such as foremen, slashers, warpers, drawers-in, loomfixers, is not reduced by the fact that the weaver tends a large number of looms. Consequently the total labor cost of weaving is not reduced in proportion to the reduction of the actual weaver's rate per yard, by the fact that a larger number of looms is tended by one operative.

Keeping the above facts in mind it may be stated that, in the case of a large variety of plain goods, the labor cost of turning yarn into cloth in the United States is not greater, and in some cases is lower, than in England. For cloths woven on automatic looms, it is especially the case; but on certain classes of fabrics the same holds true for plain looms due to the greater number of looms per weaver in this country. This does not necessarily indicate any individual superiority on the part of the American weaver. It is a matter of difference in industrial policy, whether determined by the manufacturer or the laborer, and it explains the difference in the methods of production which prevail at the present time. Where the automatic loom is now used in England a weaver tends 20 looms, as is commonly done in the United States.

In the case of finer goods, however, especially figured goods with complicated weaves, the cost of weaving is higher here than in England. This is due largely to the fact that the difference in the number of looms tended per weaver is less than in the case of plain goods. On a large part of these fancy goods (those requiring more than one kind of filling) the automatic loom cannot be used. Even disregarding the question of automatic looms, the difference in the number of looms tended per weaver on such fabrics is less than in the case of plain cloths. Consequently the comparatively small difference in output per weaver does not offset the higher wages paid in this country.

Figures are presented in the report showing that although labor costs in the cotton industry are in many cases lower in the United States than in England, yet the actual hourly earnings in this country are, in most of the principal occupations, much greater.

The conclusion that under present methods of production on many plain fabrics the cost of production is not greater in this country is also borne out by a comparison of English and American mill prices. A comparison of such prices on a large variety of these fabrics in England and the United States for the date of July 1, 1911, shows that in the case of plain goods the American price at the mill was in no case much above the English mill price, while in the majority of cases it was lower. It should be noted, however, that American prices of this date were somewhat lower than normal. The English prices are the regular quotations for the home market, and are not necessarily the prices for export and for neutral markets. In the case of fancy goods, however, where the looms tended are necessarily less, the American mill prices are in most cases higher than the English.

The subject of prices is referred to below, but the fact that in the case of a number of leading fabrics the American manufacturer is selling at less than is the English manufacturer is corroborative of the statement that plain goods can be manufactured as cheaply in this country as in England. The report also gives information as to the ability of the American manufacturer to compete in neutral markets on goods of this kind.

COST OF FINISHING

Finishing includes the processes of bleaching, printing, dyeing, mercerizing, etc. It is the general rule in England that the finishing of cotton fabrics is carried on in establishments separate and distinct from the weaving mills. This is also true in large measure in the United States. Since the converter or the weaving manufacturer must pay the actual commission charges, a comparison of these finishing charges in England and the United States is adequate to show the relative cost of finishing in the two countries.

A comparison of 60 specific samples for which finishing data were obtained shows that in most cases the differences between the charges in the two countries were slight, but that the American charges were slightly lower on most of the samples.

DUTIES IN RELATION TO COSTS OF WEAVING AND FINISHING

The report includes a table of 48 selected plain goods on which the English mill prices and the American mill prices correspond very closely. It shows that in a majority of cases the American prices are somewhat lower than the English. On these goods the present duty varies from half the total American cost of conversion to more than twice such cost. The high figure, however, applies to only two samples. In nearly all cases the duty is more than 80 per cent. of the total American cost of conversion, and in a majority of cases it more than equals the entire conversion cost in this country. These are goods in which the ratio of manufacturing cost to the total cost (which includes the value of the material used) is small, and the actual ad valorem rates of duty—that is, the duties on the selling price of the finished fabric—range from 20 to 45 per cent., with only four cases in which the duty is over 50 per cent.

The above-mentioned list, as stated, includes only standard goods of simple construction (plain, twill or sateen). A further comparison is made on 100 selected samples, covering a wide range of fabrics, as sold at retail. It is impracticable to draw any general average from these samples, but the facts for each one are set forth in the report. In general, it may be said that the ratio of duty to domestic cost diminishes as the character of the weave becomes more complicated and the number of looms tended per operative diminishes.

These figures show a large number of costs in which the duty per square yard on the cloth unfinished (in the gray) is more than equal to the total conversion cost. To take an extreme case, in the case of a plain, heavy duck, the present duty is 8 cents per square yard, which is more than six times the total conversion cost, although only 38 per cent. ad valorem on the foreign mar-

ket value. The variations are very great, running from this extreme of six times the conversion cost to duties which are less than half of the conversion cost. The ratio of the duty to the conversion cost bears little relation to the ratio of the duty to the foreign market value. Thus, in some cases, duties which are less than 30 per cent. ad valorem will be one and a half times the total American conversion cost, while in other cases duties of nearly 50 per cent. ad valorem will be only three-fourths of the American conversion costs. In the greater number of cases the duties are greater than the total domestic cost of spinning and weaving.

These same figures, taken with others presented in the report, show that the additional duties imposed on finishing processes bears little relation to the increased costs of these processes. As explained in detail in the glossary, specific duties are added for particular processes. In many cases, however, the labor cost of a fabric is increased much more by an elaborate or fancy weave than by the addition of an ordinary process of finishing. Consequently it frequently happens that the increase in duty on a cheap fabric on account of some inexpensive process of finishing is much greater in proportion to the increase in cost than it is on account of fancy and more costly and complicated weaves. The irregularity of the change in duty compared with the changes in cost is brought out in detail in the report. In the majority of cases, so far as the actual samples are concerned, for which cost figures were secured, the increase in duty is in excess of the total actual increase in cost, due to the finishing processes. On the samples used the extra duty for bleaching ranges from half the total cost of bleaching to three times this cost. The extra duty for printing is from one-third the cost of printing to one and two-thirds the cost. In the case of dyeing quite similar conditions prevail. The additional duty for mercerizing in the case of these samples was from 40 per cent. in excess of the cost of mercerizing to double the cost.

PRICES

As already stated, many standard fabrics of simple construction are sold by American manufacturers at a price as low as or lower than that of the English manufacturer. On the other hand, the English mill price of finer fabrics is in most cases lower than in this country; but it is only in the case of very few fancy specials that the American mill price is greater than the English mill price by anything like the full amount of the present duty. It does not follow, however, that the American consumer gets his goods at the same price as the English consumer. One of the most interesting results of the investigation is to be found in the facts included in the report regarding the different methods of distribution in the two countries and the greater margin which exists between the price at which the manufacturer sells his goods and the price at which the consumer buys them in this country as compared with similar prices in England. The relation of the tariff to the prices paid by consumers can only be understood by fully comprehending the significance in American trade of the principle of "set prices." This principle is fully explained in the report, and many figures are given to show mill price, converter's price, jobber's price and retail price.

The most common retail prices for different kinds of cotton cloth are 5, 7 1/2, 8 1/3, 10, 12 1/2, 15, 10, 25, 29, 35 and 50 cents a yard. These prices in turn fix the prices which the jobber can charge the retail merchant in order to bring the price of the fabric inside a given "set price" to the consumer, and these in their turn determine the prices which the jobber can afford to pay the manufacturer. The result is that under the existing system of distribution the effect of any change in cost of production or in mill price cannot be determined except in relation to the "set price" of the retail trade. In some cases a reduction of one cent a yard in the mill price might be just enough to enable the jobber to sell at a price which would bring the goods within a lower retail class, thereby possibly saving as much as six cents a yard to the consumer. In another case a reduction in price of three or four cents a yard might not be sufficient to bring the cloth into the lower class, and in this case the whole reduction in mill price would go to the jobber or retailer, or both, while the consumer would pay the same price as before.

It may be said in general that goods which are sold at the mill from eight to nine cents reach the consumer commonly at 15 cents per yard.

When mill price is 10 cents per yard the fabric is thrown into a different classification and will reach the consumer at 19 cents. An increase of the mill price from 10 to 11 1/2 cents would probably not affect the price to the consumer. When, however, the mill price goes to 12 cents, the consumer will pay 25 cents. A further increase in the mill price of two cents in this case would not change the price to the consumer.

With a mill price of 14 cents the consumer would still pay 25 cents retail. Where the mill price is, however, 15 cents, the cloth enters another classification and probably reaches the consumer at 29 or 35 cents. It will be seen, then, that an increase of two cents, from 12 to 14 cents, does not affect the 25-cent retail price, while an increase of one cent, from 14 1/2 to 15 1/2 cents, may increase the price to the consumer by 10 cents.

The same facts are brought out clearly by a study of the course of mill prices, jobbers' prices, and retail prices of the same fabric over a period of years. A good many examples of this are shown in the report. To illustrate by a certain sample quilt: This was sold by a mill in 1908 for 62 1/2 cents and reached the consumer at $1. In 1910 the mill price went up to 75 cents, an increase of 12 1/2 cents, which increased the retail price paid by the consumer to $1.50.

Another quilt of a little lower grade sold in the earlier period at the mill for 58 1/2 cents; jobber's price, 70 cents; retail price, $1. In 1910 the same quilt was selling for 67 1/2 cents at the mill; jobbers' price, 75 cents; retail price, $1. In the case of the first quilt an increase in the mill price of 12 1/2 cents increased the price to the consumer by 50 cents, while in the case of the other quilt an increase of nine cents at the mill, in the same year, did not increase the retail price at all.

The reason, of course, was that the second quilt being of a little lower value, the increase did not quite bring it out of the $1 class.

These facts, besides being of interest as showing the relation of the consumer to the producer in this country, are of importance in considering the effect of tariff changes. Assuming that the method of distribution remains the same, it would appear that the same rule would hold, whether the jobber should buy his goods of the domestic or the foreign manufacturer. We have seen that a slight reduction in the price the jobber pays to the producer might mean a large reduction in the mill price to the consumer. Conversely, a considerable reduction in the mill price might have no effect on what the consumer must pay. For exactly the same reasons, on the one hand a slight reduction in duty might mean a much more than proportional reduction in price to the consumer, whereas, on the other hand, a very material reduction in the duty might have no effect at all in decreasing the retail price.

This method of distribution is much more firmly fixed in the United States than in other countries. This fact, combined with the lower margin abroad between the mill price and jobbers' price and the lower margin between the jobber's price and the retailer's price, as compared with this country, brings about the result that goods which are manufactured at the same cost in England and the United States and sold at the same price in both countries at the mill nevertheless reach the consumer in the two countries at quite different prices.

A few comparisons may be given here to show the wider margin between manufacturer's prices and retailer's prices in this country as compared with England. Thus one fabric which sells at the mill in the United States at 8 1/2 cents a yard will be jobbed at 11 cents and sold at retail at 15 cents. The identical fabric in England would sell at the mill for the same price—8 1/2 cents—be jobbed at 9.75 cents, and retail at 13 1/2 cents.

A fabric selling at the mill in the United States at 10 1/2 cents would be jobbed at 12 1/2 cents and sold to the consumer at 19 cents, or possibly 25 cents. The same fabric selling at the mill in England at a price identical with that paid at the American mill would be jobbed at 11 1/2 cents and would reach the consumer at 15 cents.

A fabric selling at the mill in the United States at 12 cents would be jobbed at 16 1/2 cents and reach the consumer at 25 cents. The same fabric with the same mill price in England would be jobbed at 14 cents and reach the consumer at 19 cents. In the case of these particular samples it will be seen that the price received by the manufacturer is the same in both countries, but that the American consumer pays a decidedly higher price than the British consumer.

In conclusion it may be stated that the foreign cost of spinning is less than in the United States, as shown by the figures above. The same holds true for weaving fancy fabrics, on which the number of looms to the weaver in this country is not much greater than the number of looms to the weaver abroad. On account of the different mill methods in this country, the domestic labor cost of weaving on a large variety of plain fabrics of wide consumption is reduced below the foreign cost. Except in the case of a few special fabrics, and in the case of various manufactured articles, some of which are produced in this country to a very slight extent, the American industry practically supplies the whole consumption. The imports of yarn in 1910 were less than one-half of 1 per cent. of the home production in pounds. The imports of cotton cloth were less than 2 per cent. of the home production in value. Mill prices are in many cases as low in this country as in the world's markets. Where higher, as in the case of the finer classes of products, they are rarely higher by anything like the whole amount of the duty. The effect of the present tariff, then, in most cases, is not so much to add the duty to the domestic manufacturer's price as to secure him the American market; and, in the case of most articles of widest consumption, to prevent the competition of the foreign manufacturer, either in normal or abnormal times. On account of more costly methods of distribution in this country from producer to consumer, the latter pays a decidedly higher retail price than the European consumer, even in the case of fabrics on which the cost of production and the mill price are as low here as there.

THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS

The annual meeting of this Association will be held on Wednesday and Thursday, April 24 and 25 in Paul Revere Hall, Mechanics Building, Boston. The meeting is held in this hall in acceptance of the invitation of the Textile Exhibitors' Association, which is to hold an exhibit of textile machinery during that week.

The sessions will be called to order Wednesday at 11.00 A. M. and 2.30 P. M., and on Thursday at 10.30 A. M. and 2.30 P. M. Members and those proposed for membership can obtain complimentary tickets to the exhibition on showing their membership badges, which may be obtained at the entrance, where the names will be recorded and the badges given.

His Honor, John F. Fitzgerald, Mayor of Boston, will give an address of welcome to the Association.

In addition to the opening address by the president and the address of welcome, papers are expected on the following subjects: Cop dyeing, cotton manufacturing waste, decca muslins, history of cotton classification, methods of cost accounting, mill roofs, sizing equipment in cotton mills, standards of cotton yarn, steam efficiency in textile plants, the banking problem in cotton manufacturing, the buying of labor, transmission of power by rope.

WOOL AND THE "CLEAN CONTENT"

By Our Regular Correspondent

Bradford, Eng., March 19, 1912.

"The proposal to levy a duty on the scoured pound of wool implies that it is possible to select samples that are fairly representative of a consignment of wool and to ascertain the clean content by scouring and conditioning such samples.

"It also implies the establishment of conditioning houses to be maintained by the Government at leading ports of entry.

"The Tariff Board has carefully investigated this matter, and with the aid of the Bureau of Standards has reached the conclusion that it is not only possible but it is relatively a simple matter to test wool by sample at the time of importation.

"It has also ascertained that the machinery required for scouring and conditioning wool in small lots is inexpensive and could be promptly installed, and the cost of operation would be light."

(Vol. II, pp. 396-397 Report of the Tariff Board on Schedule K.)

With the purpose of obtaining information tending either to support or to refute these very definite assertions a visit has been paid to the Bradford Conditioning House, which is one of the three great official testing-houses connected with the wool trade. Its relative importance can be traced in official figures showing the weight of wool goods passed through the leading conditioning establishments of Europe in the course of 1911:

Bradford	lbs.	95,930,026
Roubaix		97,881,825
Tourcoing		99,761,444
Mazamet		43,237,656
Verviers		37,506,958
Dison		21,058,671
Reims		19,157,416
Fourmies		14,811,541

There are conditioning-houses also handling wool in Amiens, Le Cateau, Leipzig, Turin, Milan, Roanne, Vienna and Crefeld, but their transactions are comparatively insignificant. The Bradford house is making, on the 1911 basis, some 238,000 tests a year and has made 686,966 in the last three years. It draws in fees some $115,000 annually and last year made a profit of $20,000. It is an imposing place externally and internally with all facilities for dealing with wool in bulk and for drawing and testing samples. Fifteen carloads of wool, tops, noils, and waste blocked its approaches when the visit was paid, all the cranes and doorways were occupied in receiving or discharging bales and the previous week's takings in fees were $3,600. The bustle of messengers and clerks, the noises of the yard, the quick and quiet activity of the warehousemen all go to impress the visitor with a sense of the magnitude of the business.

Primarily the place is what its name implies—an establishment for verifying condition and "Condition" is the accepted phrase for water. A long way secondarily it is also a place for determining the percentage of grease or oil. Last year's statistics will bear out this point. Of a total of 237,967 tests made, 222,998 were for moisture and 3,464 were "scours" for fat or oil; in other words, there were 64 of the one to a single test of the other. And the scour tests were not all of raw wool by any means, but were scourings of wool, tops, noils, wastes, yarns and what not. The fact is plain that scour-tests form only a small part of the Bradford work and the reasons why this should be are not obscure.

Wool, in the narrow view taken exclusively for tariff purposes, in a raw commodity which, when treated with soap and water, loses so much weight and emerges clean and ready for taxable purposes. In the eye of the practical worsted man wool is a commodity convertible into tops, and the ultimate price of those tops is of very much more concern to him than the incidental loss in the wash bowl. The scouring loss affects the ultimate price, but so does the moisture or dryness of the wool at the time of purchase, so does the loss in burr and seed not extracted by washing and so does the proportion of noil to top. In an ordinary way a Bradford man wanting to know the final cost of tops out of a certain lot of wool does not trouble the conditioning-house in the matter. He sends bales as samples into his own scouring and combing sheds, or sends them to a commission comber. If the result is unexpectedly good he hurries to get more wool like the sample lot on the same terms. During the currency of a London series of auctions in which a new clip is offered a top-maker is often anxious to get his first purchases combed in the shortest possible time

in order to guide him in his later bidding. Simple scouring does not tell enough, sample tests may be fallacious. His best assurance comes from bulk lots treated in the regular bulk method.

The tops themselves are justifiably regarded by the consumers as goods which may contain an excess of water. When they are intended for foreign delivery a certificate of their condition is almost indispensible and the official figures show that very much more tops than wool is conditioned at Bradford. Out of a gross weight of 96,070,738 lbs. handled there were:

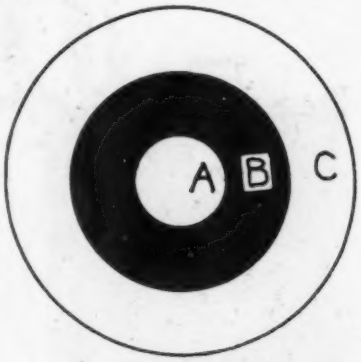


FIG. 1.

Tops	lbs.	72,150,949
Wool		9,192,924
Noils		5,064,618
Wastes, etc.		5,806,607
Worsted Yarns		2,769,729
Cotton Yarns		120,396
Silk Yarns		20,316
Materials for weighing only		945,199

METHOD IN SAMPLING

In ascertaining the condition of tops three balls are drawn from each bale and a one-pound sample (one-third round from each ball) is drawn from them. The sample is drawn from three parts of each ball, as shown in A, B and C (Fig. 1). Not uncommonly balls of top come from the comber with more moisture in their center, A, than in the part, B. The degree of moisture at the outside of the ball, C, depends, of course, upon its past surroundings. The one-pound sample of the homogeneous manufactured article known as worsted top is representative of nine portions of the three balls and when it has been drawn it is not allowed to lie about uncovered, to gain or lose weight. The material is rolled up inside a wad of waterproof fabric, pending its placing inside the oven.

The methods pursued in the simple operation of sampling a carefully-made, mechanically-perfected article like tops have been detailed with some particularity, partly as evidence that small things matter, partly as a reminder that care which is not excessive in the case of tops can hardly be superfluous in all circumstances when the bulk in hand is a less regular article, such as greasy wool. When wools, noils and wastes are sent to be conditioned at Bradford about 2 pounds is drawn from each bag from places near the top, middle and bottom marked D. E. F. in the diagram, Fig. 2. The ordinary business of the establishment, it has been shown, is with the conditioning, not with the scouring of these articles and it is manifest that moisture tends to diffuse itself more equally over a given solid bulk of wool than does sand, for example, dung or any solid material re-

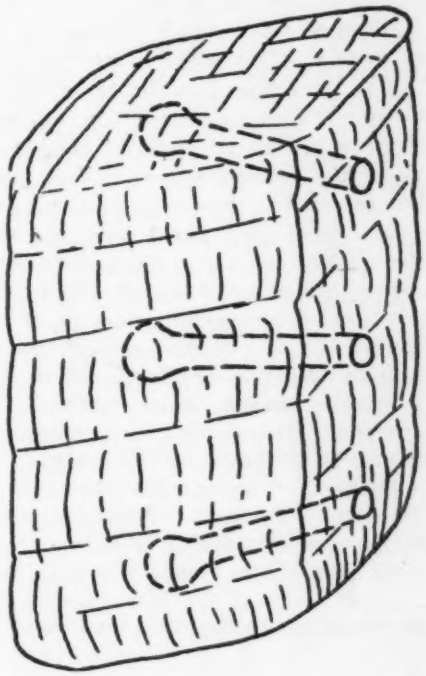


FIG. 2.

movable by scouring. The samples of wool drawn for conditioning are similarly wrapped within a roll pending their reduction to a condition of absolute dryness.

METHOD OF CONDITIONING

Conditioning is a necessary part of the determination of the clean weight of wool and the method of conditioning will be described. In Bradford conditioning comes first and is calculated on the grease weight of the wool. At Mazamet—where much scouring of skin wool is done—the wool is scoured first and the regain is reckoned on the net weight established. There are in the top and wool conditioning room at Bradford some forty ovens of the pattern shown in Fig. 3 and each oven contains three cylinders with solid sides and perforated metal bottoms. The bottom perforations are to admit the upward passage of a current of hot air which is fed to all the ovens by a main service pipe. The current is not so powerful as to blow the wool about and the air escapes through a small circular opening in the folding lid of the machine. The warmth thus supplied is reinforced by the heat of a Bunsen gas ring and a temperature is maintained low enough not to discolor the wool. While it is comparatively easy to drive off by strong heat the main part of the moisture, a long time is required to expel the last traces. The scales shown in the figure are adjusted to weigh to one grain and when they show no further loss of weight under prolonged heating a net weight is reached to which the conventional allowance of regain is added. The difference between this total and the original weight marks the amount by which

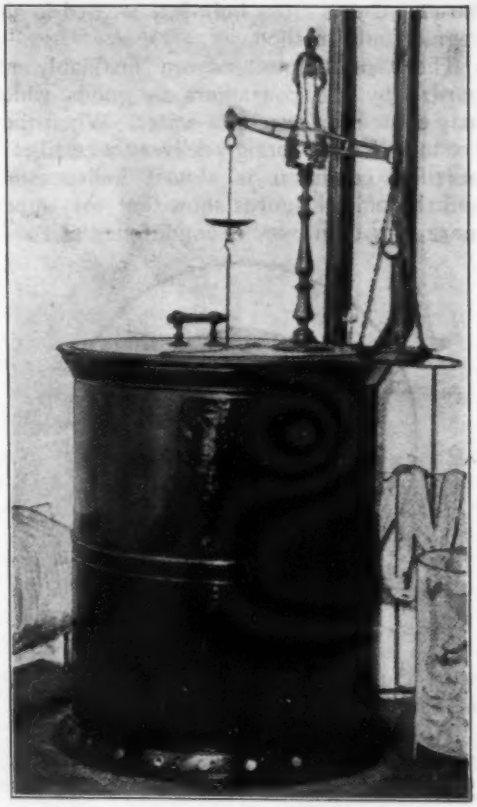


FIG. 3

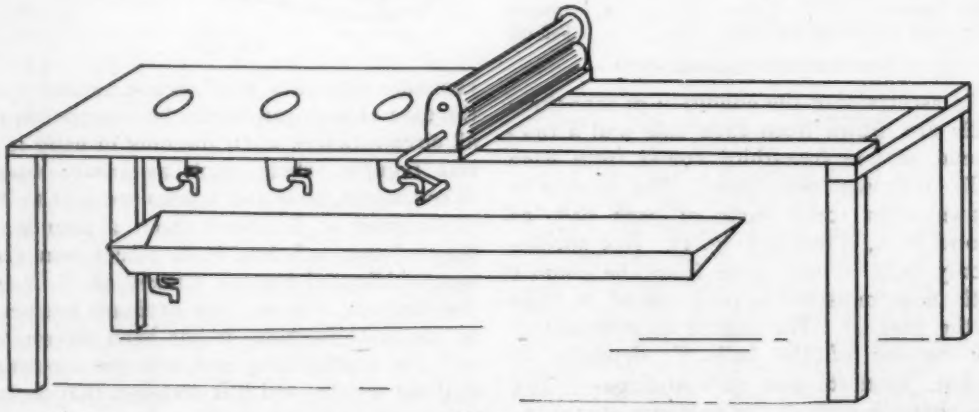


FIG. 4.

the material was under or over the standard condition. It is of importance to know that the time occupied in drying a one-pound sample cannot be reckoned, according to Bradford experience, at less than one hour.

The conditioning operation is not and cannot be a quick one. That it can be systematized and conducted continuously and cheaply is shown by the Bradford example.

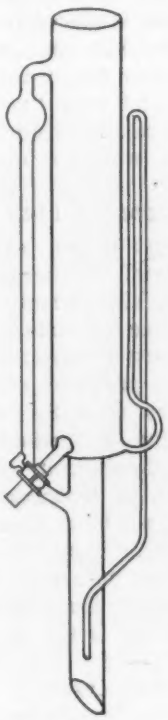


FIG. 5.

Girls attend the ovens, men draw and weigh the samples, and by putting three samples into each oven the number of ovens is reduced and the requirement of floor space diminished. The work is done at the low fee of 24 cents per test of wool, noils, tops or hank yarn when conducted upon samples submitted. If the material has to be handled in bulk, and if the samples have to be drawn by the staff, the charge is 42 cents per bale of wool, noils or waste, and is 28 cents per test of tops drawn from bulk. The operation is admittedly profitable. The fee for scouring, cleansing, drying and conditioning is 84 cents and at that the work is unprofitable.

METHOD OF SCOURING

"If I said that scouring was ten times as troublesome as conditioning, I should not be overstating the fact," said the leading official who showed me the processes in operation and explained the detail. The wool samples scoured are usually drawn by the submitting party who apportions them as he sees fit, in order to make them representative of the bales. Samples of from one to 50 pounds can be handled and a 35-pound sample of China wool, representative of 50 bales going to America was seen under treatment. For the small samples there are benches (Fig. 4) in which are fitted conical bowls with false bottoms to receive the dirt and with let-off cocks to discharge the suds. There are three bowls to a bench, two for suds and one for the final wash in fair water. The bench top carrying the bowls slides on its support lengthwise so that the bowls can be brought under a pair of rubber wringer rollers as required. The bowls are of a capacity of 1 to 1 1/2 pounds of wool and the scouring is done in a standard solution of potash soap at a heat not exceeding 130° F. and generally at about 100°. The larger samples of up to 50 pounds weight are dealt with in zinc-lined troughs, divisible into two compartments.

"How long will this lot take you?" asked my guide of the two youths who were scouring the 35-pound sample and industriously picking out the burrs by hand. "Two days," was the answer. The time is long, but the work is done thoroughly, for if not done thoroughly it had better not be done at all. It is true that the sample in hand, being heavy in lime and impurities, was a somewhat refractory one. Possibly that explains why it was sent to be scoured. Probably the wool was a mixed lot, or other conditions might have made it impracticable to determine its average character by scouring a smaller sample. The owner of the wool, who for his own reasons wanted to know the clean weight, apparently did not rely on the evidence of any smaller quantity. And there are bales of wool in which the average

assuredly could not be represented by an average of three-quarters of a pound drawn from each. Bales with sand in the center, foul locks rolled inside the fleeces and long "jargonelles" of animal exudations attached, might be averaged if they were sorted first, but otherwise small samples from them can only be dubiously representative.

Pointing out to a conditioning manager of great experience that the change of the tariff to a clean wool basis must fail of its object unless it admitted into America these more awkward consignments, I asked what he would like to do to ascertain their clean content. He could only suggest an installation of full-size wool washing, drying and air-cooling machinery. Given liberty to pick bales from bulk, cut in halves as many as he fancied, and scour them in bulk he thought that he could get a fair idea. "Of course," he reflected, "the owners might object to having their wool scoured willy-nilly." And he did not agree that it would be a simple, easy and inexpensive task to pronounce final judgment upon any lots that consumers cared to import. The opinion does not tally with that of the Tariff Board and the Bureau of Standards, but it is the opinion of a man of lifelong experience in public conditioning work, fully acquainted with its difficulties and its responsibilities.

The test described in the "commercial scour" which reproduces in general the process that wool undergoes in the regular commercial course. Carefully supervised and in case of need varied in detail in order to secure an apparently perfect commercial result, it doubtless serves for general purposes. But is it scientifically incontestable? The answer cannot be "Yes" if at the same time it has to be admitted that the thoroughness of the scour rests upon individual judgment rather than on experiences which can be verified unfailingly by other investigators. The "clean" content may not be in the strictest sense clean. There may be one or another proportion of grease left behind when to all appearances there is none. Appearances are deceptive and any practised conditioner laughs at the man who says he can tell whether wool is too wet or too dry by touching it with his hand. Short of chemical analysis there can be no proof that commercially clean wool is at the same time chemically clean and to make sure on this point it is necessary to draw samples of the scoured stuff and subject it to test by such an apparatus as the Soxhlet tube. One of these tubes is shown at Fig. 5. They are of a known capacity marked upon them in cubic centimeters. A weighed sample of the scoured material is placed in the main tube and washed in ether until the fats are dissolved. The ether drains away carrying the grease with it and when the spirit is evaporated a residue is left which can be weighed upon a balance, when its proportion can be ascertained.

CONCLUSIONS

Sampling must in any case leave some margin of uncertainty. Conditioning can be conducted with fair certainty, but not without an allowance of time. Scouring can doubtless be better systematized than at Bradford in any premises where much of it is to be done, but scouring takes more time than conditioning and where matters are complicated by the difficulty of sampling and by the presence of tenacious foreign matters, it must always be capable of presenting severe difficulties. Until the eye has told that visible foreign matter has been removed and until the analyst has vouched for the invisible remainder of fats, it is clearly impossible to say that one has scoured fully. There are thus at least four separate and delicate operations to perform in arriving at the clean content, and experience gained under a system which in effect limits importation to the cleaner and better wools is no sufficient guide as to the new difficulties to be encountered when wools heavy in grease and dirt are admissible.

American cotton-cloth mills sold $1,984,536 worth of their products to the Philippines during the first nine months of 1910, against $385,544 in the same period of 1909. However, the sale of British cotton goods in the Philippines did not decrease, being $2,007,949 during the first nine months of 1910, against $1,945,225 in the 1909 period.

Convention of the American Cotton Manufacturers' Association

The sixteenth annual convention of the American Cotton Manufacturers' Association was held in Washington on April 2d, 3d and 4th. The headquarters were at the Hotel Raleigh. There was an unusually large attendance. It had been predicted by some that the attractions of Washington would keep many of the members away from the business sessions, but the attendance was very satisfactory and the interest in the proceedings was marked. The weather was favorable and afforded opportunity for sight-seeing in the afternoons, as the program was so arranged that after twelve o'clock members were free for their own private business or pleasure.

A large number arrived on Monday evening, as the night before the convention is always a pleasant occasion when old acquaintances are renewed. On Tuesday evening President Smyth entertained the Board of Governors and a few others, including President Hobbs of the National Association of Cotton Manufacturers, at dinner at the Raleigh, about thirty-five being present. The chief social event of the convention was the reception tendered by President Taft at the White House on the afternoon of the second day of the Convention.

W. A. ERWIN, THE NEW PRESIDENT OF THE AMERICAN COTTON MANUFACTURERS' ASSOCIATION.

At least three hundred members and guests were received by the President in the East Room, and after having met and greeted each one personally, the President made a speech, which was well received. His remarks will be found elsewhere. It had been expected that the closing session on Thursday morning might arouse a lively discussion over the report of the Tariff Committee. These expectations proved unfounded, as the committees had drafted resolutions which were unanimously adopted. These were so framed that no believer in the

proper conservation of American industries could fail to object to them, while at the same time recognizing the justice of a proper revision of such rates as might be shown to be unnecessarily high. The Association went on record as favoring the tariff commission.

The ability to get together on these resolutions is more significant than appears on the surface. It shows that men of different opinions on tariff questions can find a platform broad enough for all engaged in the same industry to stand on. A spirit of concession and conciliation was shown that harmony in a common cause might prevail. It is a lesson that might well be taken to heart by the different factions in the woolen and worsted industry. Furthermore the endorsement of these "protection" resolutions by an association composed largely of Southern manufacturers is significant of the trend of sentiment in the South, and will have more influence in Congress at this time than similar resolutions passed by a Northern association.

ELLISON A. SMYTH, THE RETIRING PRESIDENT OF THE AMERICAN COTTON MANUFACTURERS' ASSOCIATION.

The first session of the convention on Tuesday morning was a little late in opening and upon the arrival of Secretary Charles Nagel of the Department of Commerce and Labor, President Smyth invited him to speak at once. His remarks were well received by the members and he was enthusiastically applauded as he left the hall. Secretary Nagel said in part:

WORK OF THE BUREAU OF MANUFACTURES

By Hon. Chas. Nagel, Secretary Department of Commerce and La or, Washington, D. C.

I confess that up to this morning I did not know what subject had been assigned to me. The fact is that I have not got fixed clearly in my mind what portion of the industry this organization represents. I know that there are several organizations, one the American Cotton Manufacturers' Association and one the National Association of Cotton Manufacturers, and you will pardon me if I have been under the impression for some time that the name of either was large enough to cover the whole

HON. CHARLES NAGEL.

country. There may be reasons for several organizations and I have no doubt there are, and there may be different conditions prevailing in the industry in different sections of the country—perhaps wage conditions, perhaps manufacturing conditions. I don't know the details of it, but it seems to me, apart from these incidental differences, there must be in both the organizations a controlling purpose; in other words, it appears to me safe to say that, industrially speaking, every organization interested in your industry is substantially of one mind. How far that can be said of the members of your organization, politically speaking, it is not for me to inquire into or even to discuss, but it is safe for me to say that in so far as your industrial judgment and your political decisions do not agree, you have presented an irreconcilable condition and you have a house divided against itself.

I feel that it is time for us to appreciate that in these modern days we have to do with economic and industrial questions, and if those problems are to be commercially strengthened, the Government must come to some decision respecting those questions respecting the whole United States. The modern questions are economic and industrial and not political.

It is true in the early days we thought the only danger rested with the abuse of political powers, and our constitution guarded against that danger by every resource known to the genius of man. But we did not realize what were the possibilities of industrial and commercial development in this country and it was far beyond the anticipations of our fore-fathers. We have gradually been brought to believe and recognize that we have a power here and that the immediate problem today is industrial and economical, involving the proprietor, the wage earner and the consumer, and when it comes to governmental activity on the one hand, that activity must take the form of regulation and control, and on the other hand it must take the part of constructive legislation. Take, for instance, the tariff question. I don't know whether you are interested in it or not, but I assume you are. I assume you may have something to say about that question. We are told it ought to be taken out of politics. Taken out how? By having politics abandon it? No! By having politics adjust itself to the industrial development of the entire country. We cannot indulge an industrial theory on the one hand and a political theory on the other hand, but must reconcile the two so that the Government will come to the aid and maintain that industrial standard upon which intelligent men agree. It seems to me that it goes without saying now, that we have had some expressions, we know that no political party wants to feed the trusts; that no political party wants to destroy the industries that are built up. Every political party wants commercial standards. The one question is, how far we want to get it. We know when the last tariff bill was up the action with respect to schedules was not controlled by the same forces that control the final vote when the schedules are framed. The representative of every section of the country take care that his section would be protected, so that in the framing of the schedules the industrial decision of the country made itself felt, but when it came to the final vote upon the bill it had to stand the test substantially of a popular vote. In other words, upon the schedules industrial judgment controls; upon the bill, the party that wants control. Is not that so? That was a reflection of the need of bringing the two judgments together. Now, as I say, industrially speaking, probably the same opinion with respect to your industry is entertained in all parts of the country—substantially so. The time was when we had all kinds of political views entertained throughout this country. Today it is not so. Why? These opinions should all be held. These, as industrial opinions, should not be abandoned, but they should be distributel throughout the country, having each represented in every part of the country.

There is a further approach that tariff legislation has made; for instance, the Tariff Board, with the idea that it may furnish the best information upon which legislation may be had. I am not here to

discuss it; that is not for me. You know more about it than I, but there is the first attempt to take the tariff out of politics. You have the result. I don't know what it will come to, but it looks to me so far very much as though we are going to destroy the only hope and for the time being lose the opportunity to take the tariff question out of politics in the sense in which it has been advocated and in the sense in which the industries of the country want it.

There are other phases of Government which you are immediately, as commercial men, tremendously interested. You are interested in the development of domestic and foreign commerce. The foundation has been laid for an actual department. I cannot say that so far it can be said to be established, because it is a very trifling beginning with very trifling appropriations, but the foundation is good. Most of you can testify to the work that is being done and possibly all of you can testify as to what the possibilities of the situation are. The practical question is, can we have a department of commerce in the sense in which foreign countries have it. Do we appreciate that we are competing with the most competent nations of the earth, and if we want successful competition make the kind of appropriations that those nations have made.

In Great Britain, Germany, France and other countries in which they have a close relation between the Government and the commercial department, in which they have schools and train men to development, there is not a superintendent in a large manufacturing concern who is not familiar with the countries for whom he is supposed to manufacture in every respect. We have much to learn and we have much to do, and an individual cannot get that information, for its cost is too much, and the Government is called upon to do for commerce in that respect what the Department of Agriculture has done for the farmers. Now what is the question? I think the immediate question is whether the trifling expenditures and appropriations which have so far been annually made for the Bureau of Manufactures of the Department of Commerce and Labor, which has to do with the development of domestic and foreign commerce, shall be retained or shall be discontinued. That, in my judgment, is a very trifling question; and retrenchment in that direction, in my judgment, does not lead to economy. The way to economy, as I see it, is to make a large appropriation that will insure tremendous development, and that may return in taxes very much more than has usually been appropriated. That is economy, and that is the manner in which the commercial development of our country and the Government must be brought together. Here we started the idea of the Department of Commerce only nine years ago, developing by degrees, and then when we have proof that it does amount to something, when correspondence doubles in the Commercial Department and the industrial forces begin to recognize what it means, it is suggested that the appropriations for its maintenance should be curtailed. It is not a political question, but it is a question of the industries of this entire country. We all realize that the benefits of each section makes for the benefits of every other section.

Every section shares its success and prosperity with the other section, and every failure of one section reflects unfavorably upon every other section, because we are one country. The national authority has taken charge practically of all large commerce. It has controlled the railways; it has regulated and denounced unfair combinations, and that in my judgment is much better understood; but, on the other hand, you need uniformity. You are laboring under difficulties, in some instances, because while you have a national government to tell you what you shall not do, that national government has not told you what you are safe in doing, and in my judgment the national government should give you the guaranteed form of an organization under which your business may stand on its own bottom and know that it is secure as long as it follows the mandate of the law.

STUART W. CRAMER, ELECTED VICE-PRESIDENT OF THE AMERICAN COTTON MANUFACTURERS' ASSOCIATION.

I am a nationalist, when it comes to national problems, and the commerce of this country of which I speak and in which we have in mind is a national and international proposition. You come here to confer about your business, no doubt. These conventions are held from time to time and have been for many years. In many respects you think they are of great importance; they bring us together; they give us the opportunity to exchange views; they make us acquainted; they establish relations commercially and socially; they teach us to understand the difference in the conditions under which this man and that man has to operate; they make for good in all respects; and beyond, your meeting, as usual, your resolutions will

not be effective unless your decision is deemed wise by the representative of the Government, who, after all, have to shape and give form to your conclusions. I think there ought to be some authorized relation between the industrial and commercial forces of the United States, and the Government, so that you may have an opportunity to give your advice on every important industrial question. You are entitled to give that advice and the Government stands in need of that advice.

You have your Chamber of Commerce at home, which makes for the good of your City. You have your State Board of Trade, which makes good for your State, and you should have your National Board of Trade, through which the forces of industry and commerce may find expressions in giving council to the Government, not only to executive powers, but to the legislative powers, as to what should be done and what should be left undone as to carrying out the existing laws and suggestions for new laws. In my judgment, such relations, properly established, would lead to infinite good, the saving of money, the avoidance of friction, the establishment of an understanding; it would make for that common policy, for that demand for common welfare which is absolutely essential to our country.

THE PRESIDENT'S ADDRESS

The year 1911 will go down into the history of the cotton manufacturing trade of the United States as one of the most harassing, unprofitable and disappointing. It was impossible to buy much raw cotton below the 15-cent basis, and with a large crop promising, and the goods market not in position to take care of a full output, curtailment of production was the order of the day, and throughout the entire country, North and South, mills were more or less running on short time. Even then, however, it was soon apparent that the demand for goods, at or below cost of production, was not sufficient to take care of the supply, and after events showed that the whole industry would have been in a sounder condition if a general curtailment, lasting two or three months, had been enforced. One difficulty was that consumers of goods were able to supply their immediate wants from the surplus that had been stored away, and mills were forced to sell at the best prices they were offered. Perhaps never before was there so irregular and uncertain a market, and quotations were far from being reliable. Buyers paid only what they were forced to pay when they needed goods, and substitution of low counts and light weights was the rule, and this condition continued until the fall, when lower priced cotton enabled manufacturers to name a still lower price for their product, and buyers then saw it was to their advantage to insist upon securing the standard weights and counts.

It has been noticeable, however, that the decline in the price of cotton has been even exceeded by the decline in the value of the manufactured product, and cotton mills have been unable to secure any better profits on 8 to 9-cent cotton than they had secured on 13 to 14-cent cotton. Perhaps the cotton mills would have been better off if the price of raw cotton had not dropped below 11 cents, as on that basis the market seemed more steady and values more permanent than since lower prices for cotton have prevailed. We are now facing a new crop, and the uncertainty as to its possible size and possible selling prices continues, but it is commonly reported that large purchases of cotton, extending over a period of several years, have been made by mills in this country and abroad, based upon lower prices than prevailing at present, and it is to be hoped that this will be one steadying influence in maintaining prices.

One gratifying feature of the past year has been the systematic investigation of export markets, both for the purpose of regaining fields that had

C. B. BRYANT, SECRETARY AMERICAN COTTON MANUFACTURERS' ASSOCIATION.

been opened, and also for the purpose of investigating and securing new markets. It has been stated that the Cone Export & Commission Company, Grinnell Willis & Co., a group of South Carolina mills consisting of Pelzer, Piedmont, Easley, Belton and others, the American and Algonquin Printing Companies, the J. Spencer Turner Company, and the Pacific Mills have been making investigations at their own expense and have had representatives in foreign countries, seeking information as to the needs of those countries and securing orders. It is also stated that the Putnam-Hooker Company, of Cincinnati, has sent its New York representative to South America for the same purpose, and Woodward, Baldwin & Co. have maintained their own representative in China, who has been located at Shanghai, for a number of years. The exports of cotton goods for the seven months ending January 31, 1912, show over 253,000,000 yards exported,

as against 186,000,000 yards for the same period in 1911, and 188,000,000 yards for the same period in 1910. I believe that American manufacturers are becoming fully alive to the importance of maintaining and increasing their export trade, and that efforts will be made, year by year, looking towards systematic efforts to secure a share of the trade of the world that fairly belongs to the American mills.

The export business with the Philippine Islands has shown marked increase during the past year, and business with China was in a very gratifying and satisfactory volume until the present rebellion and internal disturbances, which have assumed very large proportions, and naturally have caused a prostration of business in certain parts of China, and caused a stoppage of all buying on the part of the Chinese merchants. It is believed, however, that the result of the present political agitation will only result in good, and that our country particularly will benefit by the agitation, but it will be necessary for our Government to maintain, without hesitation, the principle of the open door in China, which movement was inaugurated by the great Secretary of State, Mr. Hay.

Perhaps the subject that has given American manufacturers most concern during the past six months has been the proposed revision of the cotton goods tariff. At your last meeting, on May 18 and 19, 1911, in Richmond, a standing committee of not less than fifteen was appointed on the tariff and other legislation, whose duty it was to act for and represent the Associtaion, and cooperate with committees from other organizations in all matters of legislation, and that meetings of the same be subject to the call of the chairman of said committee. The committee, when appointed, consisted of representatives from North Carolina, South Carolina, Georgia, Alabama, Mississippi, Kentucky, Tennessee, and Texas, so that all sections of the South should be represented, and take part in the deliberations of the committee. This committee had a conference in Washington, June 6, 1911, with committees from the Arkwright Club and the National Association of Cotton Manufacturers, and prepared a brief which was submitted to Chairman Underwood of the Ways and Means Committee of the National House of Representatives, and the joint committee asked for a hearing before the Committee on Ways and Means on the subject then being considered by the Congressional committee, namely, the cotton schedule, but the Democratic majority of the committee refused to meet with our representatives. Our Tariff Committee also prepared several very able and interesting bulletins explaining the working of the present tariff, a copy of which was sent to each manufacturer, and also submitted to the Congressional Committee of Ways and Means of the House.

It is admitted, of course, that no tariff ever proposed was perfect or absolutely fair and just, but our Association is on record at its meeting in May, 1909, as in favor of a tariff board or commission to investigate conditions under the present tariff and suggest changes that might be desired. As such a board had been appointed, and was investigating the cotton mill conditions in the United States, it seemed fair and businesslike to wait a few months until that board could give to Congress the benefit of its investigations before proceeding hurriedly to prepare a new cotton goods tariff, and the majority, I believe, of cotton manufacturers in this country were gratified when President Taft vetoed the crudely prepared tariff bill which had passed the Congress. I do not pretend to say that the tariff should not be changed in some respects, but I do claim that it should be changed only after patient and thorough investigation and based on accurate information. What appeals, perhaps, most strongly to Southern manufacturers is not the question whether the cotton tariff is just and right and proper, but the fact that it is a condition, as Cleveland said, not a theory, that confronts us, and Southern manufacturers have been instrumental in securing investments of millions of dollars in Southern cotton mills, under existing conditions and under present costs, which investments would be sadly jeopardized and impaired by radical and sudden changes in the tariff.

In this connection, I want to quote from the New York Journal of Commerce, of January 2, 1912, the following article, which speaks for itself, and perhaps gives information that is not generally known or recognized.

"There is a cloth now popularly used by rich and poor in this country called by various names, such as india linon, fine lawns, batiste, fine organdies and a host of trade-marked names quite as well known in dry goods circles as Fruit of the Loom sheeting. This cloth may be made from yarns numbers 60s, 80s, 100s, or 120 warps. Sheetings are made from yarns varying from 20s to 40s warps.

"Twenty or more years ago there were not many mills, surely not a dozen, in which cloths of this character could be made in competition with the imported lines. The few manufacturers and merchants who were encouraging domestic production were met from the beginning with the fiercest competition from foreign mills whose merchandising was looked after by importers. Most of the product then went into what were termed white goods, and it was no uncommon thing for English mills to dump upon this market, in a dull period in Lancashire, hundreds of cases on consignment to compete with the limited output which was then possible here.

"At the time there was little inducement that could be given by a domestic merchant exploiting this class of goods to a domestic banker or investor, for in such importing periods values were cut without reference to general merchandise worth, but with regard to crushing out the manufacture of these very fine goods here. It was next to impossible to secure cooperation of the part of dry goods retailers in giving domestic cloths a chance, and for many a year (even to this day) retailers sold some part of the domestic goods as imported fabrics. When the new principle of tariff taxation in cotton goods was embodied in the Wilson bill, and amplified and improved later in the bills that succeeded it, up to and including the Dingley bill, it was felt that when general business conditions improved investors could be drawn to place their money in the finer yarn factories.

"The idea was sound, for with the improvement

that started in this country after 1898 interest in fine cotton mill properties increased greatly, until it culminated in the great boom in mill building noted in New Bedford in the last half of the past decade.

"To test out in figures the real merit in the contention that this stimulation of industry by a special protection to the element of labor in production would be and was reflected in lower prices and greater abundance for the consumer, a specific line of india linon was selected and the prices current for it in 1889-1892 and 1911 were secured. The goods in the first year were imported and sold in competition with one line of domestic goods then on the market. That domestic line is still sold and at the prices quoted below:

INDIA LINON PRICES

Count	Width Inches	Prices 1889-1892	Prices Today
60 x 60	28	6 c.	5¼c.
64 x 60	30	7 c.	5¾c.
64 x 64	30	7½c.	6 c.
68 x 68	30	7¾c.	6¼c.
72 x 72	30	8¼c.	6½c.
76 x 72	30	8½c.	6⅝c.
76 x 76	30	9 c.	6¾c.
80 x 80	33	9½c.	7½c.
76 x 84	33	10 c.	7⅝c.
84 x 84	33	10½c.	7⅞c.
88 x 84	33	11 c.	8 c.
92 x 88	33	12 c.	8½c.
92 x 96	33	13 c.	9 c.
96 x 100	33	14 c.	9½c.
96 x 104	33	15 c.	9¾c.
100 x 108	33	16 c.	10¾c.
104 x 112	33	17½c.	11½c.
108 x 120	33	19 c.	12½c.
112 x 124	33	21 c.	14 c.

Prices above are for the same counts and widths.

"It will be noted that the greatest reductions have occurred in the higher priced and more closely woven cloths. They are the goods that are now so generally used and known as fine Indias, fine batistes, fine Persian lawns, and by other names. They go into lingerie, shirt waists, dress cottons, children's communion dresses, aprons, etc., and they are so abundantly made that they are no longer the luxury of the rich man's daughter as they were a quarter of a century ago. The prices quoted at this moment are relatively high because the goods were made from the very high cost cotton of last year, but they are still so low that some of the cloths are actually selling cheaper per yard than a wholesale merchant in Manchester gets for them for shipment out of England. Today hardly a yard of these goods is brought in here, and the same importers who tried to crush out the domestic industry when it was started are now selling only the domestic goods, and one of them said, 'They are the best goods of their class in the world today.'

"What has been said here pertains to plain cloths. There are other lines of fine yarn cloths offered in fancy weaves and colors. In a measure, what has been said of plain cloths applies to the fancy goods. But the point sought to be made is that, despite the abuse of protection as it has developed in this country, there are many facts and figures that can be marshalled by any fair-minded statesman which will show that protection wisely directed, has greatly stimulated textile production here, and for the ultimate benefit of the consumer."

Your Committee on Cotton Exchanges have had one or two conferences with the New York Cotton Exchange, and will doubtless be prepared to make a further report to you at this session.

I would suggest for further consideration by our Association the appointment of a Committee on Rules for Cotton Buying, seeking some uniformity of action with manufacturers, North and South, and establishing rules that will be uniform, generally observed, and alike fan to buyer and seller, and providing for the settling of disputes without recourse to the courts.

The grey goods contract which was prepared by a joint committee from our Association and the National Association, and formerly accepted by our Association, has made slow progress in being put into general use, but we believe that this form of contract will be in the future the generally adopted form and basis of trading, and it is to be hoped that the contract will become gradually and steadily in use, and that sentiment will so crystalize around it that the widespread cancellations that we had in 1908, and the disputes that followed, will be avoided.

You have doubtless read the report from the Bureau of Labor of the United States Government, to be found in Vol. XVI of the Report on Women and Child Earners, on typical cotton mill workers, which is unfair and unjust to Southern cotton mill people, and doubtless is also to those of New England. One glaring omission that is always to be found is the so-called investigations of professional philanthropists or paid emissaries is a fair comparison of present conditions and standard of living with former surroundings, and in this report it is conspicuously lacking. It is also always noticeable in the so-called investigations of Southern mill conditions that isolated cases of hardship and low standards of living are greatly exaggerated, and the many mill villages in our Southern States with a contented, prosperous population, surrounded by many comforts, and those people maintaining a high standard of living, are purposely overlooked and unnoticed. Senator Overman, of North Carolina, has made a manly defense of the Southern cotton mill people on the floor of the United States Senate, and Representative Steadman, of North Carolina, and Representatives Bartlett, Tribble and Adamson, of Georgia, later in the House of Representatives at Washington, were outspoken in their condemnation of the report of the Bureau of Labor, insofar as it referred to Southern mill conditions, and the thanks of the Association are due to Senator Overman and Representatives Steadman, Bartlett, Tribble and Adamson for their eloquent defense of our employes.

At the last meeting of your Board of Governors, the membership roll of the Association was purged of 100 or 200 members who had failed for a year or two to pay their dues. While this re-

duces our apparent strength in membership, it leaves a compact working body, which takes an active, strong interest in the affairs of the Association, and this large meeting is an indication of the interest taken in the work of our Association.

It is my sad duty to bring officially to your attention the loss sustained by our Association in the death last November of the Chairman of your Board of Governors, Charles D. Tuller, of Atlanta, Ga., who was also President of the Georgia Industrial Association. Mr. Tuller was President of the Exposition Cotton Mills, of Atlanta, a successful manufacturer, a man beloved by all his friends and acquaintances, and worthy of that respect and esteem.

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ILLUMINATING ENGINEERING COOPERATION

By G. H. Stickney, of the General Electric Company, Harrison, N. J.

It is well within the memory of the present generation when artificial light was but little used in industries and all work ceased with the setting of the sun. In those days the open flame gas or kerosene lamp only were available; these being later followed by the so-called "2,000 candlepower" open arc and 16 candlepower incandescent electric lamps and the incandescent mantle lamps. No effective auxiliaries were available and no one realized the advantage to be gained by properly arranging and equipping the lighting units.

Times have changed with regard to the use of light. The last decade has seen a revolution in lighting units and methods. The gains in efficiency of light production have exceeded anything in other lines of development and surpassed the dreams of even the most imaginative. Improvements in methods of installation and equipment have followed rapidly and this, with the lessened cost of light and realization of its value, has increased the popularity of artificial light until today its use is as widespread as successful activity.

With the large number of lighting units and devices now available and the realization of the economy to be effected by the proper selection and installation of units, the engineer responsible for a lighting installation is confronted with many complex and important problems. Not only must he secure effectiveness and economy, but his installation must conform with the rapidly rising standard of lighting practice.

The advent of the Illuminating Engineering Society was coincident with the inception of this portentious movement. It was undoubtedly a result of the movement; on the other hand, it has been an important cause and guiding element in its activity. Inasmuch as light and illumination are closely associated with every form of human endeavor, the Illuminating Engineering Society finds that its field borders on that of nearly every industrial and civic organization.

Another happy circumstance has developed within the past few years: the commercial world has just learned the value of cooperation. Hence it is that the Illuminating Engineering Society has realized the common ground between it and other organizations and has come to appreciate the great benefits which may be secured through mutual cooperation. To apply this idea, Dr. A. E. Kennelly, the 1911 President of the Society, appointed a Committee on Reciprocal Relations with other Societies. Dr. H. E. Ives, of Cleveland, is chairman and the present speaker one of the several members. Under the leadership of Dr. Ives, this committee has prepared a tentative method of procedure with a view to securing the results desired. A list of live, representative organizations with whom cooperation seemed desirable, has been prepared and advances made by various members of the committee. Without exception, our suggestions have been received with cordial and prompt support.

Some of the first fruits are the joint meetings

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which the New York section has projected with the American Institute of Electrical Engineers and the Institute of Architects. The presence here today of the speaker is the result of your interest in the necessity for cooperation, and it is hoped that you will be so impressed with the advantages of this activity that we can establish a relationship that will be productive of great mutual help.

Now let us consider the existing conditions. You represent a large body of light-consumers desirous of obtaining effective, reliable and economical illumination for the purposes of your business; we represent a large body of those devoted to the production and utilization of light, who are interested in the advancement of the Art of Illumination and the extension of its usefulness. We need your practical experience in building up our knowledge of the Art of Illumination. You need our development and lighting experience for application to your particular problems. How can we help each other?

There seems to be three promising avenues for the advancement of intersociety cooperation, namely:

A—Formation of a joint committee on Mill Lighting Practice.

B—Holding of joint meetings, and

C—Exchange of papers at conventions and meetings.

Joint Committee.—In accordance with this idea, a committee on the practice of cotton mill lighting would be formed, either as a joint committee between the two societies, or as a committee in the Cotton Manufacturers' Association on which the Illuminating Engineering Society would be represented.

The purpose of this committee would be to study the illumination practice and requirements for various processes of cotton manufacturing to the end of recommending for standardization such practice as may seem, under the conditions, to be most desirable. The report of such committee should provide data which would be of especial value to both organizations.

Joint Meetings.—The Illuminating Engineering Society has sections established in Boston, New York, Philadelphia, Pittsburg and Chicago. Arrangements have been made in the past for joint meetings of sections of this Society with the American Institute of Electrical Engineers and other engineering organizations. There are several meetings of this type projected in the near future. The usual plan has been to select a subject of mutual interest to the two societies and have papers presented by representatives of the two societies, either separately or jointly, members of both societies entering into the discussion. There seems to be some question as to the practicability of this scheme in this instance, inasmuch as the Illuminating Engineering Society has no section in the part of the country in which, it is understood by the speaker, the American Cotton Manufacturers' Association is principally represented. It is possible, however, that some modification of this idea could be adopted.

Inter-Society Papers at Conventions and Meetings.—The Illuminating Engineering Society would welcome at its annual conventions or at section meetings, papers on the subject of cotton mill illumination by representatives appointed by your association, and, on the other hand, stands ready to suggest or recommend authors from the membership of the Illuminating Engineering Society who might present papers on lighting at your conventions from the standpoint of the illuminating engineer. Moreover, when such subjects are under discussion we would be glad to suggest others capable of discussing the subject, or, reciprocally, to have the suggestions made by your association in connection with our meetings.

The adoption of one or more of these means of intersociety cooperation must necessarily have a broadening and educating effect in both organizations. Such papers and discussions representing, as they would, the different points of view, cannot fail to enlarge the viewpoint of the members.

The speaker will be exceedingly glad to discuss these propositions further and hopes that the interest aroused will bring forth definite and concrete suggestions from your members.

It gives the speaker the greatest pleasure to extend to you the cordial good wishes of the Illuminating Engineering Society, and the wish that we may have the pleasure of friendly constructive cooperation.

At the conclusion of the President's address, Andrew E. Moore of Gastonia presented to President Smyth, on behalf of the Association, the President's gold medal, and took occasion to speak in terms of praise of the splendid work done by President Smyth during the past year, which he declared was one of the most trying years in the history of cotton goods manufacturing in this country. Mr. Smyth acknowledged the medal in a few graceful words of thanks.

Secretary Bryant announced that committees representing the New York and the New Orleans Cotton Exchanges were present, and that they would confer with the members on any subjects of mutual interest that might be desirable. The New York Cotton Exchange sent as its committee: President George W. Neville, R. E. L. Lewis, G. H. Miller and Colonel W. V. King. The New Orleans Exchange sent W. R. Stewart, Charles A. Francis, Edward S. Butler and R. H. Holmes.

The reading of special technical prepared addresses completed the morning session.

DOES THE AMERICAN COTTON INDUSTRY NEED THE PLANT BREEDER?

By DAVID R. COKER, Hartsville, S. C.

The steady advance of the boll weevil into the cotton belt has produced alarming results. Most of the best upland cottons formerly produced in the United States were raised in the western portion of the cotton belt, nearly all parts of which have now been invaded by the weevil. The varieties generally planted there were late in maturing, and, being unsuited to boll weevil conditions, have been mostly abandoned. In their place have been introduced the earliest and shortest staple varieties, for only these mature in time to get ahead of the weevil.

A number of influential agencies are now earnestly working for the general betterment of agricultural conditions in the South. Among the most important of these are the United States Department of Agriculture, the Agricultural Departments of the various States, the Agricultural Colleges, some of the agricultural journals, the Farmers' Union and the Southern Railway.

If these agencies should become convinced that a very great benefit would accrue both to the

farmer and to the spinner from a thorough campaign of education in favor of scientifically bred and more carefully handled cotton, it would be only a short time before results of large value would be obtained.

It seems to me that much could be accomplished in calling attention to the immense importance of this work and in securing the desired cooperation for its promotion, by a carefully selected committee of your organization with sufficient funds at their disposal. Under their direction literature on this subject could be prepared and distributed and,

DAVID R. COKER.

I think, with proper effort all the agencies mentioned above and a number of others could be brought into close cooperation for the purpose of seconding your committee's propaganda for the betterment of the quality of the crop.

It may not be known to all of your members that considerable work along some of the lines mentioned above has already been done in South Carolina.

Upland cotton breeding was begun in our State about twelve years ago by Dr. H. J. Webber, of the Plant Breeding Bureau of the United States Department of Agriculture. Within six or seven years he had developed from short staple selections two most excellent varieties of 1 3/16 to 1 3/8 inch staple, which he named Columbia and Keenan. Both of these varieties have ever since their introduction been regularly producing at least as much cotton per acre as the average of the short staple sorts.

The writer also took up cotton breeding about ten years ago and has produced one variety by the selection of notably good plants from a short staple variety and breeding from the best of their progeny in each generation for five years. I have also produced another variety by selection and breeding from one excellent plant of Columbia variety. This breeding work is being carried steadily forward at Hartsville with constantly broadening scope, not only with cotton but with many other economic crops as well, and we now have a well equipped and efficient plant breeding organization which is an important department of our business. One phase of our work, of which I expect much, is the propagation of some notably early and productive strains of staple cotton which I hope will perfectly meet the requirements of the boll weevil district and which I expect to have in sufficient quantity for distribution before the weevil reaches our State.

According to the South Carolina Experiment Station records my established varieties possess the desirable characters of high yield, long lint and even staple. I have had a hard fight to convince our staple spinners that these pedigreed staple varieties are entirely different from the old, non-productive, wasty staples which were formerly produced in small amounts in our territory, but I can say that those who have tested them to any extent now buy them freely on at least equal terms with western staples, and some have expressed a decided preference for them.

The farmers who have planted my "Hartsville" variety for several years have regularly made larger yields than with the short cottons they have tested against it, and, besides, it is much easier to pick, does not fall out of the burr, makes very high grade lint and, under good conditions, turns out a staple of 1 3/16 inch length. My newer variety, which I have named for Dr. H. J. Webber, the father of upland cotton breeding, is much longer in staple and apparently more productive than any cotton, long or short, which is planted in our vicinity.

About three years ago the Cotton Manufacturers' Association of South Carolina contributed a considerable sum of money to be expended by the South Carolina division of the United States Farm Demonstration Bureau in the testing and distribution of the new pedigreed staple cottons. One of the prominent mill treasurers of the State also contributed liberally to this fund and he and a number of other prominent spinners and also our Secretary of Agriculture have given much encouragement to this industry.

The result so far has been that a large proportion of the staple cotton needed by South Carolina mills during the current year has been produced within the borders of the State and, unless all signs fail, South Carolina will produce more than enough staple cotton this year to supply all the staple spinners of both North and South Carolina.

The territory contiguous to the town of Hartsville produces more staple cotton than any equal area in the State. Last year fully twenty per cent. of the cotton produced in our section was staples, and this year about three-quarters of the acreage will be seeded to staple varieties.

During the past few years the writer has done all he could to call the attention of the farmers to the principles of plant breeding and seed selection. Numerous articles have been prepared for the press, thousands of circulars have been mailed,

lectures have been delivered where time and opportunity permitted, and a plant breeders' association which consists of about thirty of our most enlightened agriculturists has been organized. In further encouragement of the staple industry my firm has provided at Hartsville good facilities for ginning and marketing staple cotton.

In consequence of such efforts most of the farmers in the Hartsville section (and many elsewhere) now understand that pure, well-bred seed are necessary for the production of the greatest yield and the longest staple and that careful handling at every stage is necessary for best results.

I see no reason why the results accomplished in the Hartsville territory cannot be widely extended by similar efforts elsewhere.

At the last annual meeting of the Cotton Manufacturers' Association of South Carolina I presented an argument for the buying of all cottons strictly on staple, calling attention to the fact that short staple varieties vary tremendously in length and quality and yet, in most of our cotton markets, all sell at the same price. Some of these varieties average not over 5/8 inch in length and others which are equally productive are about 1 1/16 inches. If all the cotton mills would refuse to buy cotton except on staple, would have the length of every bale purchased by them carefully determined before accepting it, and would discriminate in price against cotton of inferior staple, this in itself would very quickly drive out the shorter varieties, besides being of obvious benefit to the mills.

If very high yield and very short staple were always correlated there would be some reason for using the very short varieties. My own experiments, however, and those of any experiment station which sets down the length of the varieties tested, prove this not to be true. In fact, my breeding work seems to show that the opposite is more often the case, as the progeny rows from my longest stapled plants are very often the best in actual yield.

The value of the plant breeder's work is no longer open to question. In almost every department of plant life to which he has devoted any effort, the results have been prompt and valuable —often incalculably so. Many millions have already been added to the wealth of the United States by the plant breeder. Hundreds of the brightest minds of the country, many of them in the Bureau of Plant Industries here in Washington, are engaged, through plant breeding, in assisting Nature to produce better and more bountiful harvests.

There is little reason to doubt, from the incalculable value of the work of the plant breeder in other departments and the considerable results already accomplished in cotton breeding, that by earnest cooperative effort every desirable feature of the cotton plant can be greatly improved to the immense benefit of the industry; and it is my hope that your association will have a prominent part in bringing our planters to a prompt realization of the vital relation that exists between plant breeding and the prosperity of both the cotton producer and the cotton spinner.

THE BOLL WEEVIL PROBLEM

By W. D. Hunter, Bureau of Entomology, U. S. Department of Agriculture.

For years the weevil has attracted great attention, which has generally centered largely among cotton planters who were the first to suffer. State and national conventions have been held to discuss the matter and large sums of money have been appropriated by State and Federal agencies for the fight against the pest. Of course, it is not the cotton planters alone that are interested. The problem comes home to the members of this association for the reason that the weevil has become an important factor in cotton production in the United States, and this interest on the whole will

W. D. HUNTER

increase as the insect continues to advance into the cotton belt.

The boll weevil invaded the United States in the vicinity of Brownsville, Tex., about 1892. It was investigated by the Department of Agriculture in 1894, and its capacity for damage became so evident that the Department made the suggestion that its advance be checked by establishing a zone along the Rio Grande in which the cultivation of cotton should be prohibited. A general failure to realize the seriousness of the situation was the reason that no action was taken at this time on the recommendation of the Department.

Since 1894 the weevil has advanced regularly at the rate of about 50 miles per year. In favorable seasons and localities the advance has been as much as 120 miles, while some seasons of unfavorable climatic conditions have shown an actual

shrinkage in the infested territory. The insect has invaded a region in which the conditions are entirely unlike those in its original home and a process of adaptation is under way. In some cases the adaptation has not proceeded far enough to enable the insects to persist in this country. This is the explanation of the occasional setbacks it has received. On the whole, however, hardier weevils are being produced each season and this process will continue indefinitely.

In 1903 the boll weevil crossed the Louisiana line and in 1907 the invasion of the State of Mississippi began. The infested territory now covers 271,000 square miles, in the States of Texas, Louisiana, Mississippi, Kansas, Oklahoma and Alabama. The outer border of the infested territory forms a curve, extending from about Mobile to Memphis and Little Rock and thence southwesterly to the Mexican border.

The boll weevil is a small beetle of inconspicuous appearance. It exists in four stages, namely, eggs, larva or grub, pupa or chrysalis, and adult. The winter is passed in the adult stage, the weevils seeking shelter in trash in and about the cotton fields and in the forests. Emergence from hibernation begins normally in February and continues until about the first of July. The earliness with which the weevils leave hibernating quarters depends upon the amount of shelter they have found and the penetration of the sun. As soon as emergence from hibernation takes place the weevils fly to the cotton and begin to feed upon it. If the cotton is young and no squares have been formed the weevils place themselves upon the so-called bud at the top of the plant and feed upon the young tender leaves. If there are squares upon the plant, however, the insects go to them and do not molest the leaves. The female weevil bores a hole into the cotton fruit at the bottom of which an egg is deposited. In four or five days' time this egg hatches and the larva feeds upon the tissues of the square. This results in the falling of the square to the ground in a short time. Later in the season when the weevils become very numerous in the fields the bolls are attacked exactly as are the squares. However, the bolls do not drop to the ground but the locks within which the weevils are found do not develop and the remainder of the locks fail to develop normal seed and lint.

Reproduction is very rapid. During the warm months a generation is produced in less than fifteen days. The possible progeny of a single pair of weevils during the season is over 12,000,000 individuals.

It will be noted that the weevil affects the cotton plant in a manner which is very vital as far as the interests of the planter are concerned. That is it simply removes the fruit almost as soon as it is formed. The plants continue to grow and to put on fruit. At the end of the season a magnificent stalk is produced but its fruit has largely been destroyed by the insect.

To estimate the amount of damage done by the insect is not an easy matter. One of the important considerations that confronts us is that the losses are both direct and indirect. The planters suffer by the decreased production and railroads, banks and merchants suffer indirectly. Moreover, the damage is not uniform in different seasons. Climatic conditions exert a profound effect upon the multiplication of the insect. At the same time there is a great variation in the same season in different localities. One region may be provided with shelter which allows a high percentage of the weevils to pass the winter, while another without such shelter furnished comparatively few weevils to injure the crop. The estimation of the damage caused by the insect is complicated further by the fact that certain compensations are returned. A diversification of crops is forced upon the planters. This in many cases brings about a better system of agriculture. For this reason it is frequently said that the boll weevil is a blessing in disguise but no planter is known to the writer who would not greatly prefer to have diversification brought about by less revolutionary and less disasterous means.

In 1904 the State Entomologist of Texas estimated a direct loss for the preceding five years of 1,725,000 bales. At this time the weevil was confined to Texas.

In 1909 a careful estimate resulted in the determination of an average loss per acre in Texas of $3.90 and in Louisiana, where the problem is more serious, of $15.25.

One of the most careful estimates of weevil damage that has ever been made was furnished by the Bureau of Statistics, of the U. S. Department of Agriculture, based upon the injury to the crop of 1900. The inquiry was conducted by correspondence with a large number of reporters throughout the cotton belt. Other factors affecting the crop injuriously were taken into consideration. The result showed a loss due to the weevil of 1,267,000 bales of 500 pounds for the year. At the price current during that season the value of this loss would be $88,056,500.

In a general way it may be stated that for some years the weevil has caused a reduction of the cotton crop of the United States varying from 200,000 bales to over a million.

In this connection it is important to call attention to the very large crop produced in 1911. The inquiry naturally suggests itself as to why with the continued spread of the boll weevil such an unprecedented production could be reached. A careful examination of this question leads to the conclusion that the large crop of the year 1911 was due to several factors. The acreage was large and the conditions throughout the growing season were unusually favorable. Moreover, the boll weevil was less numerous throughout its range and did much less damage than is normal. This is the result of two successive seasons of drouth and two winters of unusual severity. This combination of climatic checks reduced the weevil to as low a point as it can be expected to reach at any future time. In general the damage was less by fully 75 per cent. than it would be under normal conditions. Therefore the weevil infested territory was relieved temporarily of a large portion of the damage and furnished an unexpected and abnormal contribution to the crop of the country. In other words the large crop produced in 1911 is an indication of the power of the boll weevil. It shows what can be produced when its depressing effect upon production is relieved.

From the foregoing statements it is evident that the boll weevil problem is one of considerable magnitude and one which will not lessen in importance as years pass. Serious as the problem is the writer can agree with H. A. Stone, a prominent economist and cotton planter of Mississippi, in the statement that no other insect since the dawn of history not excepting the Egyptian locust has had to bear the burden piled upon it by the boll weevil. With the incoming of the weevil there is a tendency to overlook all factors which have for years contributed to a lessened production. Consequently the boll weevil frequently is accredited with powers and damage which it does not possess. The actual loss it has inflicted has been augmented by panics that in many cases have been entirely unjustified.

The spread in the United States will undoubtedly continue and many changes in the system of agriculture will be brought about. In spite of these facts the situation is not alarming. The writer sees no reason to suppose that the United States will not continue to maintain its supremacy in the production of the staple. The centers of production will be changed, there will undoubtedly be a strong westward movement. Undoubtedly there is sufficient land in the west to produce enough cotton to offset the loss in humid regions where a great reduction in acreage is inevitable.

A Trip in Africa and the Red Sea Districts in Connection with American Cotton Goods Trade

By Edward C. Suffern, New York, N. Y.

When your President asked me to read a paper before you, it was with combined pleasure and hesitancy that I accepted. It is not easy for me to put in words my experiences in Africa, they seem to lose by the telling, but if I had your President's well-known gift of speech, it would not be quite so difficult a thing.

During the early part of 1910, a number of American cotton mills decided to send a representative to Africa and the Red Sea districts in order to inquire into the causes for the decline of certain foreign trade and to report to them such steps as might be necessary to increase their present business. They chose me to act in their behalf in the matter, since I was not only familiar with the customs and the conditions prevailing in the countries they wished to reach, but had many warm friends among the leading people in that section.

In September, of 1910, I left New York for Africa, first going to London and then crossing the Channel into France, and on to Marseilles, from which point I took a French boat to Aden. Aden is probably too well known to need much description, but it is an interesting old Arab town and is of great commercial and political importance. It has much the same relative position to the Red Sea in guarding its entrance, that Gibraltar has to the Mediterranean, and for many years past it has been prominent as a port of entry for the interior of Arabia, the Persian gulf, Africa and the smaller Red Sea ports.

It was not many years ago that "Americania" or gray cotton sheeting played a most important part in the commerce of this part of the world, and it is still of much consequence, but the inroads made into the American trade by our foreign competitors have been serious, although I feel that America is regaining much of her lost ground; still it is not pleasant to realize that one or two houses that have their buying offices in New York are not content with importing the American goods, but also import into Aden competing Italian and English fabrics.

To go back to my trip. From Aden I crossed the Red Sea to Djibouti, in French Somaliland. Djibouti is far different from Aden, and the few palms and bits of green here and there make a most acceptable change from the desert-like character of the port of Aden. I went by railway from Djibouti to Dire Doaua, a distance of 191 miles, which takes from eight to thirty-six hours, depending on the condition of the road. I once waited in Dire Doaua two weeks for the railroad to be repaired. Dire Doaua was the last place that I would see for some time where there were real hotels and a white community. It was Christmas Eve that I arrived there and it was a trifle forlorn. Most of my baggage was in the custom-house—including a plum pudding which I had brought from America for that especial night. However, I found a piece of fruit cake, "Made in Germany," and it was not a bad substitute. A day or two later I started off for Harrar, thirty-five miles away. I had sent my heavy baggage on by camels and had with me a couple of small tin boxes on one mule, my sleeping outfit and my boy's box on the other mule, and started off to Harrar with a couple of boys to look after the two baggage mules, an Abyssinian who was mounted to lead the way, my boy and myself on two forlorn hired mules. We were not a very talkative party, as no two of the boys could speak the language and accordingly such conversation as there was was carried on between Ishamail, who had been my constant companion for some time, and myself. Unfortunately, it was impossible to start in the early morning, and it was 10.30 or 11 o'clock before we got under way, and I knew it was necessary to hurry things along as quickly as possible if we wished to reach Harrar that evening.

The mules and the boys were slow and the way was very, very steep, and how it was possible for mules to walk up the sheer straight rock is a thing I have never been able to understand. At times I tried to hurry them along by going a mile or two in front, but I did not care to lose the small party entirely and accordingly I would have to wait for them. The gates of Harrar are closed at 6.30 or thereabouts, depending upon what the gatekeeper considers 6.30, and so when it became late in the afternoon and no signs of any city were visible I had visions of sleeping in an Abyssinian hut, and while I had done such things and have not minded them, I was at that time somewhat new to Abyssinia. My rhino-hide riding whip was softer than my mule's hide and the most vigorous beatings had no effect on making them hurry, and so you may imagine how pleased I was when suddenly the guide stopped and made a sharp

turn and we found ourselves riding through one of the gates of Harrar.

The streets were miserable little dark places, sometimes only wide enough for one mule to squeeze by at a time, most terribly uneven and filthy. Harrar has many dogs, and as they make a special point of always dying in the streets, their bones are laying all around, probably not particularly adding to the sanitation of an already filthy city.

I was welcomed in the hotel by an Englishman whom I knew well by reputation and we and two Germans made up the entire European or American population of a city of, I believe, 100,000 inhabitants. There were, however, a number of Greeks, Armenians, Turks, etc. The hotel had only three bedrooms, and as I was the last arrival, of course mine was the poorest. There was a door which did not close, and nothing approaching a window, but again I was pleased to see that there was one sign of America in the "Americani" or cotton sheeting covering the walls and ceiling of this mud room. Harrar was the starting point of my long trip into the interior, and as I had never seen nor talked with a person who had been to Adis Abeba, the capital of Abyssinia, I, of course, experienced much difficulty in getting my caravan together, buying my mules, engaging mule men, soldiers, cooks, wood boys, tent boys, etc., without end, and the delay was further a source of annoyance to me as I had a number of communications from Adis Abeba urging me to reach there as soon as possible. However, at last everything was complete and I sent my caravan off one morning to follow the next day with my head boy and my head soldier, the other boys all having gone along with the caravan. The first day was rather a hard trip, as I had planned to cover a much longer distance than is usually taken in one day, but after that we probably did not average over fourteen to eighteen miles a day. It was the most beautiful and interesting trip I have ever had, the way up leading over high mountains and through vast forests of virgin timber, the scenery varying from tropical to semi-tropical and even temperate. At times the effect of the forest would be rather that of flowers, vines, etc., growing from heaven downward, as in fact they did, as many of the plants and vines are parasites. The denseness, the beauty of the whole effect, made it hard to realize that it was not all merely a picture or a dream. In this particular part of the country there was very little game, and I am ashamed to say that I used to shoot at the monkeys just to keep in practice. However, we later came to an entirely different part of the country, where there were a certain amount of large game and quantities of guinea fowl, pigeons, and small game, so that our larder was always well stocked.

In Adis Abeba I was received most warmly, doubtless due to the fact that any stranger is a welcome diversion. I had the pleasure of meeting the present Emperor and most of the members of his government. There are but very few European merchants, but a fair amount of trading is done there by several Armenian and Abyssinian traders who import Americani and send it into the outlying districts in exchange for the produce of the country, rubber, wax, etc.

I wish there were time to tell you some of the strange and interesting customs of this half-wild and half-civilized but ancient country. After a stay of some weeks I returned by another and far different route, spending days in the broiling heat of the desert.

In reference to Abyssinia, it was rather a shock to me when I was in Manchester, the other day, to learn that the first pure cotton shipment of English-made cloth was on its way to Abyssinia. This means that the great stronghold of our mills, viz.: the making of pure cotton cloth, has now been taken up by certain of the English mills, because the small native traders have all recently had shown to them the advantages of our pure cloths over the sized goods of the other nations. It is not out of the way here to speak of the vast difference between the policies of the English or other foreign mills and that of the American mills. The mills of England are ready to alter their constructions, change their looms, etc., as much as required by the foreign purchaser, whereas the mills of this country are far too tightly bound to the old customs, and when a new cloth or something a little out of the ordinary is asked, a flat refusal to make any change is apt to be the result. Perhaps this policy may have had some bearing on the fact that last year the increase in British foreign trade in cotton piece goods was as great as the whole foreign cotton goods trade of America. This is rather appalling and our only remedy is to cater to the export business and follow its requirements more intelligently. There are, we know, certain mills in the States which are anxious to hold and increase their foreign trade, but even they are far too prone to keep to what they think will meet the requirements, rather than that which is actually wanted.

There are certain large lines of business which could be secured by American mills if they would make slight changes in their present equipment. The foreign field is only scratched at present, and there is a great opportunity for the extension of this business through the introduction of new cloths and a more consistent and accommodating policy. This paper will show, however, that certain manufacturers are fully alive to all opportunities and that by some at least every legitimate effort is being made to encourage the export business.

British manufacturers have built up their export business largely by adhering to the Indent houses, or, as we call them here, Export Commission houses. The British merchants work hand in glove with these firms of foreign shippers, who by their own financial resources, coupled with backing of foreign banks and financial institutions, make possible the easy extension of commerce to the outlying corners of the world.

The native knows quite well what he wishes, and it is only natural that the mills which do cater to this trade and do attempt to meet the requirements are the ones which hold and increase their export trade. The native houses must have absolute confidence in the people from whom they purchase and be sure that the goods will arrive according to the sample. There have occasion-

ally been a few rather unresponsible American merchants who have attempted to enter the export market and who have really done great damage to this trade, but fortunately such cases are few and far between.

The remarks which have been made in reference to Abyssinian business hold equally true of conditions on the East Coast and in Uganda.

It might be mentioned that one of the greatest difficulties which the merchant seeking export trade has to overcome is that of finance. It is but in rare instances that the foreign purchaser is either willing or able and in many cases is far too ignorant to satisfactorily finance the business, and to give credit to these men is taking a far greater risk than the profits of the transactions would warrant. However, the export market forms a vast outlet for the products of our American cotton mills, and the opportunity which is waiting for them in the foreign fields is large, but can only be gained through a careful study and an intelligent management of that part of their business.

The program for the second day's session began with the address of George W. Neville, President of the New York Cotton Exchange.

COTTON EXCHANGES, PRODUCERS, COTTON MERCHANTS AND SPINNERS

By George W. Neville, President New York Cotton Exchange, New York, N. Y.

Mr. President, and members of the American Cotton Manufacturers Association: In accepting the invitation of your President to address you today, I asked him what he wanted me to talk about. "Anything," was his reply, and as this was a specific subject you can readily understand that I knew then what was in his mind, but how to get it out of his mind and into language, was another thing.

However, in a gathering of this nature there are only two subjects to talk on, viz.: raw cotton and finished cotton goods. Nature has given us a large supply of raw cotton this season, and the moulders of feminine fashions have decreed that the ladies shall wear more yards of cloth in their garments, and as one of my friends with a mathematical mind figured the scanty attire of the fair sex cut out at least twelve yards of finished goods per female inhabitant of the civilized world, this scant attire cut a very large figure and was a contributing factor to the small demand for finished goods the past two years.

Worthy of mention here is the enormous yield of cotton this season in the oldest cotton growing States: North Carolina, 1,152,000 bales; South Carolina, 1,722,000 bales; Georgia, 2,867,000 bales, and it may be of interest to some of you not coversant with the production of cotton in its details, that from 1791 to 1811 South Carolina and Georgia produced practically the cotton crop of this country. The yield of lint per acre in the States producing large quantities of cotton is still at its maximum in North Carolina and South Carolina, notwithstanding they are the oldest cotton producing States.

With the increased acreage and larger crops, the increased spindleage in the South, the change from coarse to finer goods, and the inroads of the Mexican weevil in Louisiana, Mississippi and Arkansas, the development of staple cotton cultivation has been forced in the Atlantic States, and by seed selection and plant breeding South Carolina has surprised the cotton world this season by the production of 1 3/16 to 1 5/16 inches staple cotton, and we may expect to see a large production of this character of cotton the coming season in the Atlantic States.

It was my pleasure to preside at a conference of representatives of your organization, the National Association of Cotton Manufacturers, and the New Orleans and New York Cotton Exchanges, to consider suggestions that the two spinning organizations wanted to make, and during the discussion it was plain that a good part of your antagonism to cotton exchanges was due to your not being familiar with the by-laws and rules and the economic functions of the cotton exchanges.

Cotton exchanges, to perform their true services to the entire cotton trade, must have their rules and by-laws such as will provide facilities to farmers of the South, through the cotton merchants, that will give a constant daily market for all merchantable and spinnable cotton that weather conditions enable the farmers to produce. It is wise, however, to have some limitations as to the lowest grade deliverable on a contract of sale for the future delivery of cotton, although I believe in giving a grade for every kind of cotton that is usable, in order that the farmers may have some way of determining the value of their product.

The New York Cotton Exchange was organized and a charter granted by the New York State legislature in April, 1871. The purposes of the institution are clearly set forth in the third section of its charter.

"The purposes of said corporation shall be to provide, regulate and maintain a suitable building, room or rooms, for a Cotton Exchange, in the city of New York, to adjust controversies between its members, to establish just and equitable principles in the trade, to maintain uniformity in its rules, regulations and usages, to adopt standards of classification, to acquire, preserve and disseminate useful information connected with the cotton interest throughout all markets, to decrease the local risks attendant upon the business, and generally to promote the cotton trade in the city of New York, increase its amount and augment the facilities with which it may be conducted, and to make provision for the widows and families of deceased members. The said corporation shall have power to make all proper and needful by-laws, not contrary to the constitution and laws of the State of New York or of the United States."

The grades deliverable on contract against a sale for the future delivery of cotton ran from good ordinary to good middling, with low middling as the basis grade, but after the American Standard Classification was made, on September 1, 1874, the New York Cotton Exchange, in adopting this classification, took middling cotton as the basis for trading in cotton for future delivery, effective September 1, 1875, and the other cotton exchanges shortly after adopted the same limitations.

Your organization has been very urgent to make the lowest grade deliverable on contracts low middling. To do this would be treating the farmers

of the South unjustly, and as each contract for 100 bales of cotton traded in on any cotton exchange calls for the delivery and acceptance of 100 bales of cotton, all cotton exchanges should provide for the acceptance on contracts of purchase and sale of all merchantable cotton raised by the farmers of the South. There are seasons when the qualities of cotton produced are such that there are very few bales of grades below low middling, and when this occurs you have a low middling contract; but there are seasons (this one, for instance) when, for some reason, the qualities below low middling are superabundant, and the facilities of the cotton exchanges, in justice to the bale of cotton, should provide a constant daily market for such grades. The lowest grade deliverable on contract is good ordinary, and this is a good spinnable grade, usable in every mill where yarns or goods are dyed or printed.

Cotton exchanges represent the evolution of the trade of the cotton merchant, who distributes the cotton as the farmer produces it and supplies you gentlemen with the qualities you require to make the special lines of goods you manufacture, and, by the way, you gentlemen all seem to think the farmer produces nothing but strict middling cotton. The other grades which the farmer has to sell and the cotton merchant has to buy, to get you your strict middling, have to be taken care of, otherwise the element of speculation on the part of the cotton merchant would be so great that the merchants, having to do with the distribution of the cotton from farmer to spinner, could not buy from the farmers as freely as they do now, because the risk of fluctuations would be greater than the margin of profit that exists today. The evolution of this feature of the business developed the cotton exchanges, where buyers and sellers meet and trade in contracts for the future delivery of cotton. The New York Cotton Fxchange was organized primarily by the cotton merchant, for his protection against price fluctuations, and here I wish to take issue with my learned predecessor in his statement that it was created for the cotton merchants alone. Cotton exchanges provide facilities for all cotton interests, whatever may be the lines of their endeavor, and to the investor, as well. The membership of the New York Cotton Exchange today embraces merchants residing in practically all of the cotton producing States, bankers, spinners and some engaged in planting cotton. If cotton manufacturers only sold their goods when the cotton was being marketed, and the farmer only marketed his crop when the mills sold their goods, there would be no use for cotton exchanges; but, gentlemen, this is not or never has been the method of the business. You gentlemen have opportunities of selling the product of your mills for many months ahead, at a time when there is very little cotton being marketed, and to buy this cotton (if it existed), warehouse, insure and borrow money to carry it until you could convert it into finished goods or yarn, would enhance the price to such an extent that your over-sea competitor, by using the Liverpool contract market, would get the business. Consequently, you either buy contracts for the future delivery of cotton on some cotton exchange, or buy your exact quality from some reliable cotton merchant and he in turn buys contracts for the future delivery of cotton on some cotton exchange, to protect himself against price fluctuations, depending upon the price at which he sold you your quality, to give him his profit. This method fixes the cost of your raw product when you sell your goods, without depreciating the price to the producer.

The New York Cotton Exchange does not trade in contracts for the future delivery of cotton. The members of the New York Cotton Exchange in New York trade on the floor of the New York Cotton Exchange in contracts for the delivery of cotton, both for immediate delivery and for delivery in the future on the basis of middling. This is necessary, as at the time when large business is possible with you, the quality nor quantity of the crop is not ascertainable, and the basis middling contract has to be broad enough to take care of all merchantable cotton raised; and through the Inspection Bureau of the New York Cotton Exchange its members accept delivery of cotton against a purchase of contracts for future delivery, good ordinary to fair, low middling tinged to strict good middling tinged, and middling stained, provided it is merchantable cotton, which is defined by section 42 of the by-laws:

"Merchantable cotton shall be understood to be cotton as gathered upon the plantations of the United States, ginned with the usual machinery and with customary care, and showing no indication of fraud.

"Unmerchantable bales, which shall invariably be rejected—shall be understood to include false-packed bales, bolley, threshed, or machined cotton, and bales that show an excess of seed, sand, or dirt, rebaled cotton, bales that have been on fire, or any other bales not conforming to the above definition of merchantable cotton, it being the intention of this section that only the regular run of cotton, as picked from the fields of the cotton States of the United States, shall be considered merchantable."

All cotton submitted for delivery is inspected on the docks by employes of the Inspection Bureau, and as bales are accepted they are given lot numbers, such lot numbers having a letter to denote the warehouse system where the cotton is stored. The samples are then taken to the classification room, each sample broken in three parts, one part aired for twenty-four hours, the second part put away and kept by the Inspection Bureau during the life of the classification certificate, and the third part is delivered to the merchant offering the cotton for inspection. The original is then classed by two members of the Classification Committee, and this Committee is not permitted to engage in any other business. The Inspection Bureau of the New York Cotton Exchange guarantees to the holder of a grade certificate the grade mentioned in this certificate, under rules to this effect. Each 100 bales of cotton, or 50,000 pounds, has to be covered by warehouse receipts and grade certificates bearing the same warehouse letter, and no delivery is deemed as in fulfillment of a sale that has warehouse receipts bearing two different warehouse letters, and the party attempting such delivery is penalized heavily.

The present management of the New York Cotton Exchange has under consideration certain changes in the system of inspecting and certificating of cotton, that will in our opinion facilitate the delivery, the acceptance and shipping of cotton from the warehouses in New York.

The classification in use by the New York Cotton Exchange is the American Standard Classification adopted by the National Cotton Exchange in June, 1874, whose membership embraced all cotton exchanges then in existence in the United States. The cotton exchanges met in Augusta, Ga., and appointed a committee of experts to meet in New York in August 1, 1874, to prepare these standards.

The New York Cotton Exchange has continued this classification and will continue to do so until such time as other carefully prepared standards take their place.

The Government Standard Classification, to be complete, should have standards made from Upland or Atlantic States cotton, which cotton is the basis of all cotton traded in for future delivery on all cotton exchanges and is the quality quoted in all markets the world over where American cotton is bought or sold. The New York Cotton Exchange has been criticised and threatened for not adopting the Government standards. We are willing to meet this criticism and have no fear of the judgment of cotton people in the position we have taken on this question. We have always stood for uniformity in classification, but just for uniformity's sake we are not going to adopt a standard that does not represent the quality of cotton traded in on any cotton exchange in the world, for the future delivery of cotton, or that does not represent the character of cotton quoted daily in all cotton markets of this country and Europe.

The conferees of your Association, the National Cotton Manufacturers Association, the New Orleans and the New York Cotton Exchanges, passed a resolution in October, 1911, asking the Secretary of Agriculture to make a standard of Upland cotton to match the Government standards. The entire proceedings of this conference were given the Department of Agriculture in November, 1911, and efforts have constantly been made since then to have these standards made, but the member of Congress who framed the resolution calling for Government standards refused to amend the law so as to provide for Upland cotton, although his growth of cotton was standardized.

Those who recalled the interesting discussion of a similar subject at Richmond last year were disappointed that there was no discussion of Mr. Neville's able paper.

In the absence of Honorable John Barrett his paper which followed was read by title only.

CENTRAL AND SOUTH AMERICAN MARKET FOR COTTON GOODS

By Hon. John Barrett, Director of the Pan American Union and formerly U. S. Minister to the Argentine Republic, Panama and Columbia.

By way of introduction, the relationship of the Pan American Union to the subject under discussion should be briefly stated. The Pan American Union is an international organization maintained by all of the American republics. It is not simply subordinate to the United States Government or

HON. JOHN BARRETT

a bureau of the State Department, as is sometimes supposed. It belongs to each one of the twenty republics lying south of the United States as much as it does to the United States. The Pan American Union is maintained, in short, by all of the twenty-one American republics from the United States south to Argentina and Chile, each government contributing pro rata of population to its support. It is controlled by a governing board made up of the ambassadors and ministers of the Latin American countries accredited to the United States Government and the Secretary of State of the United States, who is chairman ex officio. Its affairs are directed by a director general and assistant director, who are chosen by this governing board. These officers in turn are assisted by a staff of commercial and trade experts, statisticians, compilers, editors, translators, librarians, stenographers and clerks.

The great object of the Pan American Union is to develop commerce, closer intercourse and bet-

ter acquaintance among all the American nations; and for the accomplishment of this object it is in touch with both North and South America, and in fact with all of the world, with government officials, commercial organizations, manufacturers, merchants, exporters and importers, and shipping interests, while on general lines it is in touch with men in public life, editors, newspaper men, college presidents, professors, students, scientists, travelers, and others, providing them all with information which will increase their knowledge of or interest in the twenty-one American nations. It publishes an illustrated monthly bulletin which is in great demand in all parts of the world as a carefully edited and attractive record of the present conditions, general progress, commerce, laws, new enterprises, and particular development of each American republic. The Pan American Union also publishes numerous handbooks, pamphlets, special reports and maps, of which a printed list can be obtained upon application.

* * * * *

Almost at our doors lie twenty Latin American republics whose imports of foreign manufactured goods now amount to much over one thousand millions of dollars per annum. This trade is increasing year by year at a constant ratio, taking the fat years with lean years and averaging the same, of from 11 to 12 per cent. These countries are rich and prosperous, rich not only in the potentialities of the future, and no man who has seen them doubts that these potentialities will be realized, but rich in the present. The per capita foreign trade of Latin America, imports and exports taken together, for 1910, the last year for which we have complete statistics, amounted to $31.82. For the same year the per capita foreign trade of the United States was $37.18. The per capita of Latin American imports was $14.36, and of exports $17.46. The comparative figures for the United States were $16.96 and $20.22. In a number of the Latin American countries the per capita foreign trade far exceeded that of the United States, i. e., Cuba, per capita of imports $48.01, of exports $69.88, of total $117.89; Argentina, imports $48.82, exports $51.72, total $100.54; Uruguay, imports $38.49, exports $38.97, total $77.46; Chile, imports $30.89, exports $34.29, total $65.18.

The following table of imports of Latin American countries in 1910, showing the share of the four leading commercial nations, the United Kingdom, Germany, France, and the United States, has been compiled in the Pan American Union from the original official customs reports of the several countries.

LATIN AMERICAN IMPORTS, 1910

Countries	Total Imports	From United Kingdom	From Germany	From France	From United States
Mexico	$97,432,891	$11,125,808	$10,134,038	$8,715,422	$56,421,551
Guatemala	5,251,317	1,135,420	1,249,559	273,215	2,181,859
Salvador	3,745,249	1,165,993	407,392	262,294	1,346,597
Honduras	3,019,416	424,077	284.387	101,720	2,059,522
Nicaragua	2,583,257	625,668	286,408	131,826	1,341,692
Costa Rica	8,152,501	1,318,474	974,371	321,106	4,181,506
Panama	10,056,994	2,166,989	966,151	307,982	5,652,653
Cuba	103.675,581	12,292,219	6,542,760	5,514,939	54,569,393
Dominican Republic	6,408,838	708,612	1,108,375	266,667	3,884,918
Haiti	5.880,678	586,190	196,886	644,315	4,271,046
Latin North American Republics	$246,206,722	$31,549,360	$22,150,327	$16,499,486	$135,910,767
Per cent of total imports		12.00	8.99	6.70	52.20

Countries	Total Imports	From United Kingdom	From Germany	From France	From United States
Argentine Republic	$341,217,536	$106,096,072	$59,295,021	$32,641,121	$46,966,325
Bolivia	18,135,000	5,060,452	2,487,824	251,773	1,241,925
Brazil	235,574.837	67,061,065	37,455,530	22,268,307	30,253,918
Chile	108,582.279	34,340,573	26,296,071	7,010,929	13,369,774
Colombia	17,025,637	*4,100,000	*2,600,000	*1,700,000	*5,100,000
Ecuador	8,024,105	2,483.945	1,574,135	526,615	2,254,303
Paragua	5,374,837	1,244,533	733,082	234,898	202,766
Peru	22,508,021	7,619,984	3,339,951	950,516	4,112,180
Urugua	42,796,706	12,125,682	6,438,561	3,665,166	3,457,195
Venezuela	12,387,552	3,625,681	2,039,287	998,906	3,788,539
South American Republics	$811,626,510	$243,757,987	$142,259,462	$70,348.231	$110,746,925
Per cent of total imports		30.03	17.52	8.67	13.64
Total of the Twenty Republics	$1,057,833,232	$275,307,347	$164,409,789	$86,847,717	$246,657,692
Per cent of total imports		26.03	15.54	8.21	23.31

* Estimates

Over three-fourths (76.8 per cent.) of all imports of Latin America were of the ten republics of South America, and something less than one-fourth (23.2 per cent.) of the ten republics north of the Isthmus. Of the one-fourth, our share was more than one-half (55.2 per cent.), but of the three-fourths of South America our share was less than one-seventh. Most significant of all this one-seventh represents only a few lines of trade.

Whereas Latin American and particularly South American imports cover the whole range of human needs, wants and luxuries—for these are not manufacturing countries but producers of primary foods, metals and raw materials—the United States supplies these demands only for a very limited number of things. Subtract from our export trade to South America coal oil, railway material, agricultural machinery, patent medicines and drugs, sewing machines, small tools, automobiles, boots and shoes, and but little remains. Among what does remain the cotton textile industry makes no very brilliant showing, yet the sum total of all imports of manufactures of cotton into South America is at least equivalent to a sum equal to the total imports at present from the United States.

On account of the difference in classification it is not feasible to make a table showing South American imports of cotton goods covering more than one country in a single table. In some countries the various textiles are not differentiated; in others, piece goods, yarns and ready-made clothing are grouped together, and in all of them there is more or less over-lapping in all classes of mixed goods, so that no composite table could be constructed. But from a careful study of individual statistics of these countries, it is safe to estimate the cotton manufactures imports of South America at a sum considerably exceeding $100,000,000 per annum. Of this amount the share of the United States is so inconsiderate as frequently not to be differentiated. In such cases it is lost for statistical purposes under some such heading as "miscellaneous" or "other countries."

Allow me to present as an illustration some facts of cotton and cotton manufactures imports from the official statistics of Argentina, the country having the largest cotton imports of any of the Latin American republics, amounting to nearly $35,000,000 per annum. Nearly one-half of this is from the United Kingdom, about six and one-half millions from Italy, over five millions from Germany, two and one-half millions from France, nearly two millions from Belgium, eight hundred thousand from Spain, and a little over seven hundred thousand from the United States. This is a bad showing, but the figures I give of gross amounts are not half so bad as is the actual condition when we examine the particular items going to make the total. Some of these items are:

Cotton towels and toweling (in round numbers) $230,000; United State's share nothing; for five years the total amounted to less than $900. Cotton cloth, silk finished, with small percentage of silk mixed, over $900,000; United State's share $1,024; for five years it amounted to less than $2,000. Cotton cloth, with small percentage of wool mixed, nearly $1,900,000; share of the United States, nothing; for five years $85. Cotton cloth not otherwise specified, over $700,000; share of the United States $4,355; for five years less than $26,000. Cotton cloth, dyed, $10,800,000; share of the United States $15,740; for five years less than $38,000. Cotton prints, over $3,800,000; share of the United States $29,035; including this, for five years $36,586. Bleached cottons, $4,000,000; share of the United States $12,396; for five years $77,000. Unbleached cottons, $1,210,000; share of the United States $50,906; including this, for five years less than $75,000. Handkerchiefs, $700,000; United State's share $18; for five years, $6,165. Stockings $1,500,000; share of the United States $815; for five years $2,044. Spool cotton $627,025; share of the United States, nothing; for five years less than $10,000. All-cotton blankets and blankets with slight wool mixture, $100,000; share of the United States, nothing, and nothing for five years. Laces $1,400,000; share of the United States $916; for five years $7,370.

What then are the cotton imports from the United States? Principally raw cotton, $72,682, out of a total of $86,826; bags $103,405, out of a total of $380,000; canvas and sail cloth (white) $130,662, out of a total of $180,000; canvas and sail cloth (colored) $42,474, out of a total of $185,000. In imports of raw cotton and of white canvas and sail cloth, the United States leads, and these are the only cotton products on the list of which this is true. In cotton bags and in colored canvas and sail cloth, and I may add candle wicks, of which of the last the total imports are $38,000 and the United State's share thereof $10,144, the United States is second.

Bad as this showing is for the United States cotton trade with Argentina, the showing is much worse for all the other South American countries, with the exception of Colombia and Venezuela, where it is a trifle better. It is several degrees better still, though far from being good, for all of the ten countries of Latin America north of the Isthmus. For example, let us look at the cotton trade of Mexico, the country nearest to the United States and with which we have the best transportation facilities. In Mexico, cotton manufactures are grouped under three broad, general heads—thread and yarn, cloths, and ready-made articles. The total importation being $5,412,550, of which thread and yarn and cloth together amounted to $4,078,070. Of this last amount the share of the United Kingdom was $2,651,533, Germany $376,293, United States $361,486, and France $235,035. The importation of spool cotton was $875,610, of this the United Kingdom furnished $796,725, Germany $32,595, Belgium $28,033, and the United States $17,042. Cheap cotton laces, $608,982, of this the United Kingdom furnished $363,939, Germany $133,012, France $82,103, Spain $16,644, and the United States $7,403. The importation of cotton cloth, under fourteen classifications according to weave, was $2,068,306, of which the United Kingdom furnished $1,195,726, the United States $314,569, Germany $154,350, and France $128,523. In ready-made cotton goods, principally under-

clothing, the United States makes quite a respectable showing, in some particular lines heading the list.

I recognize that no business man is going after a trade unless there is money to be made in that trade. It would be useless for me in my efforts to increase the trade of the United States with Latin America to stop short with showing you the enormous buying capacity of these countries and to tell you what your rivals the English, German, French, Italian, Spanish and Swiss cotton spinners are already doing in this field, unless I can convince you, members of the American Cotton Manufacturers' Association, and other manufacturers, that here there is a profitable business for you. In any export business, the first simple primary fact to be considered is whether as a manufacturer you can place your goods on the market at a cost to you no greater than the cost to your competitors. Can you manufacture as cheaply as they can, or, if not, are there compensating advantages equivalent to difference in cost, or, on the other hand, if you can manufacture more cheaply, have your competitors compensating advantages which will more than offset your advantage in manufacturing cost.

After all, who are your competitors in this foreign market? Are they home producers, or are they, like yourselves, foreigners?

There are many factors to be considered before a confident answer can be given to some of these questions. As to costs of production and margin of profit required, the American manufacturer must answer this question for himself, and moreover each individual manufacturer will give his own answer. While I, or my staff of co-laborers in the Pan American Union, may be able to give you some valuable information as to the precise needs of the Latin American cotton goods trade, or how to pack and ship your goods or how to sell the same, yet I must assume that in all matters of manufacture and costs in general you are better informed than I am or can be.

Where I can be of assistance to you is: First: In showing what the Latin American market is, i. e., what it buys, how much, and from whom. This I have briefly outlined above.

Second: In showing the conditions under which one must operate if he desires to enter this market. These conditions group themselves under three heads—transportation, credits, and tariffs.

In transportation the American cotton manufacturer enjoys a considerable advantage over his European competitor in freight rates. He will continue to enjoy this advantage so long as the main current of tonnage sets as it does at present and this will no doubt be for many years.

Latin America, the United States and Europe form a shipping triangle. On this triangle the main current of freight, the tonnage, is up from South America to the United States, then from the United States to Europe, and then from Europe to South America. This current represents the high freights. The reverse current, much smaller in tonnage, represents the low freights The greatest disparity exists on that arm of the triangle between South America and the United States. Here the north-bound freight is more than four times the weight or volume of the south-bound freight. Consequently freight rates from the United States to South America must under natural conditions remain low until the balance is restored. As compared with New York, the freight rates on cotton goods from Liverpool are higher to Havana by 40 per cent., to La Guaira by 92 per cent., to Buenos Aires by 143 per cent. and to Calao by 56 per cent.

Credits. Latin American merchants have been accustomed to longer credits than are usual in the United States. Six months and even more is not uncommon. I will not dwell upon this matter, since it has been so often and so well covered, except to say that Latin American credit is good, in fact there is no better, and that the tendency is towards shorter credit periods.

Tariffs. Here I believe is the crux of the whole matter, the reason why our cotton manufacturers cut such a poor figure in Latin American imports Freights are in their favor and long time bills are no serious obstacle, but tariffs—this is something at which the American manufacturer shies.

The difficulty is not in the tariff itself, for the Latin American tariff is a quite harmless bugaboo when you come to know it well. The main difficulty is in the American point of view as to tariffs in general. It is in applying to an export trade what the American manufacturer has learned about tariffs as affecting foreign competition in his own domestic trade. The difficulty is further complicated by this unfamiliarity with the exporter's point of view as to any tariff.

Now there is no parallel whatever between the Latin American tariffs as affecting the American or other foreign cotton manufacturer in the matter of his exports to Latin America and the tariff of the exporter's own country as affecting his domestic trade. Not only is there no parallel, but unless he is able to free his mind entirely from everything he has learned about tariffs in the latter trade he can never sucecssfully compete in the former. The two sets of conditions are not only not alike, they are diametrically opposed. This is true whether the tariff of his own country and of the country to which he exports be both revenue or both protective tariffs, or whether the one be revenue and the other be protective. His chance of doing business, however, is influenced primarily by the extent to which the foreign tariff deviates from the protective principle and approaches a revenue standard. In Brazil and in Mexico the protective principle in cotton duties to a limited extent exists, but so limited and the industry in these two countries not yet being on a basis to supply domestic wants, it is scarcely necessary to consider protection from any standpoint as affecting the foreign manufacturer. With these exceptions—in truth not exceptions—Latin American cotton duties are all on a purely revenue basis. This is the fundamental fact about which all other facts group themselves. It means that in no Latin American country is the foreigner in any line of cotton goods excluded. The market is open for all and for everything.

Of course it is understood that the tariffs of

these twenty countries differ widely one from the other. In some the rates are high, in others they are low. In some they are high on one class of goods and low on another, and vice versa, but they are all on a revenue basis. This being so and the value of the imports showing that even the high schedules do not to any great extent curtail consumption, it can be easily seen that the importance of the tariff is reduced to a minimum in so far as it affects unfavorably the foreign manufacturer. He may from this standpoint consider for all practical purposes the tariff as non-existing.

But from another standpoint the tariff is of vital consequence. This standpoint I may call the technical, the bringing together expert knowledge of cotton textile manufacture and expert knowledge of tariff schedules and appraisements. The two are necessary, otherwise the tariff cannot be read intelligently, its pitfalls avoided and its opportunities taken advantage of.

The Pan American Union is constantly in receipt of letters of inquiry of this kind: "What is the duty in Chile on cotton goods; or on unbleached cottons; or, sometimes, what is the duty in Latin America (twenty countries) on cotton goods (one thousand articles)?" Such letters as this are the despair of the tariff expert, for here is someone who wants to know something and the Pan American Union is sure that it can help him if only it knew just what was needed. It is worse than useless to send a copy of tariff schedules, for without appraisements, these schedules are, in computing duties, misleading in the highest degree. Even if a sample of the goods accompanies the letter—and this it seldom does—our expert most often finds himself unable to classify the goods without that technical knowledge which only the textile expert possesses. There are twenty countries and appraisements are on a different basis in each of them. These bases are often contradictory and it has been humorously said that what is an overcoat in one country is an undershirt in another.

I will give you an example of how a tariff applied without understanding the importance of the appraisement can be misleading. An American manufacturer of knit cotton underwear hearing that the duty in Argentina on his line of goods was 40 per cent. ad valorem and computing the 40 per cent. on his factory price, to which he added freight and other charges, contracted on this basis to deliver in Buenos Aires duty paid a large bill of a certain kind of goods. When he came to pay the duty he found that instead of being 40 per cent. on his factory price, it was 40 per cent. on an appraisement of 2.45 pesos per kilo, i. e., 40 per cent. of $2.38, or about 42 cents a pound. This was an expensive mistake and one that should not have been made.

In another case a piano manufacturer was asked to quote a price on an extra fine grade of upright pianos in Argentina. The duty on pianos he ascertained to be 25 per cent. ad valorem. His factory price on this grade was nearly $500. He quoted a price duty paid according to his own appraisement of value. As a matter of fact the appraisement of this particular piano in Argentina was less than $150, and in consequence he lost the sale. The French manufacturer who got the order was better informed and received a net price for his pianos more than the American thought he was offering his for.

J. M. Hause who was to have read a paper on the "Lancashire Cotton Trade" was unable to be present, and his paper was not presented, but will be printed in the pamphlet of the Association.

Joseph Newberger, of Memphis, Tenn., then addressed the Convention on the subject of "Tare, Weight, Allowance, Patching and Bagging." Mr. Newberger's paper was prepared after the program had been printed and his address was unexpected to many, and proved to be a very interesting feature of this session. Mr. Newberger said in part:

"The question of weights and the question of the covering on cotton has been a matter of dispute since my advent into the cotton business some thirty-two years ago. The question of weight among the American spinners began by allowing 1 per cent for the difference in weight in cotton between the point of origin and the final acceptance of the same at the mill.

"It was a common practice for buyers to add five pounds per bale to their weights where they were allowed 1 per cent. franchise in weights; and if the cotton gained in weight and there was no claim they were simply ahead that much; and, in fact, it has been a common practice for the past twenty-five years to figure this 1 per cent. franchise as a part of the profits of the business. Later the American mills realized this was being done and they then put the loss in weight at three pounds per bale. Then two years ago another revolution swept over the country and it was decided that the matter of weights was to be determined by the final weights at the mills."

Regarding the side cloths that were placed on cotton bales Mr. Newberger said:

"These side cloths are of absolutely no value either to the farmer or the spinner, and are also of no value whatsoever to the buyer, because a great many compresses in the rush of business in attempting to compress 120 bales of cotton per hour frequently drop the side cloths altogether; and within the past twelve years these side cloths have come to be regarded as a nuisance."

The speaker said that the "question of tare, which is causing so much trouble and on which the stand of the spinner is undoubtedly correct, because the patches are put on cotton in nearly every instance, has but one purpose, and that is to add weight to the cotton; the ostensible purpose of putting these patches to cover the sample holes you, as well as I, know is not true.

"Now, I propose that a new rule be adopted—that where cotton has no side cloths, and only the original bagging is put back on the cotton to cover it; if the compress is careful they can make just as neat a package with the original covering, that the tare on the cotton will not exceed 24

pounds; and, I propose if this is done and there are no patches put on the cotton there will be no claims whatsoever for tare; and that if there are any patches of any kind or character on the cotton, that these be taken off the bales at the mills, weighed, and charged back to the shipper regardless of whether there is 22 or 24 pounds on the bale—this is my idea of handling the tare question.

"The next question is the matter of weights. My friends, are you aware that at least one-half and possibly three-fourths of the cotton exported to Liverpool is based upon what is known as the mutual allowance system? That is, the buyer bills the cotton to the mill at the identical weight by which he purchased the cotton; when the cotton reaches the mill if it gains in weight the buyer gets the benefit of such gain; if it loses the buyer makes it up to the mill."

Secretary Bryant read his annual report, which showed the Association to be in a flourishing condition financially, and with a large active and associate membership.

A. A. Thompson, Chairman of the Committee on Bills of Lading, submitted a report of what that Committee had done. Railroads have continued to give validization certificates on foreign shipments which have apparently satisfied buyers of exchange. Bills were pending in Congress, making railroads responsible for bills of lading signed by their agents, whether they had received the goods or not, and it seemed probable that one of these bills would become law during this session of Congress. Railroad agents are exercising much more care in signing bills of lading than in former years.

Soon after luncheon members, guests, and the ladies of the party, assembled in the White House grounds so that a photograph might be taken before entering the White House. After shaking hands with everyone the President spoke as follows:

PRESIDENT TAFT'S SPEECH

Gentlemen of the cotton industry—I am very glad to see you and to welcome you to the White House. I want to say a word that I hope will meet with your approval. We are in this country in respect to every business on a protective tariff basis. I do not mean that every business needs a protective tariff to enable it to live, but I mean that there are so many businesses that are dependent on a protective tariff that they may live; that to take away a protective tariff from them would disturb the whole business foundation of the country. Therefore, it is essential that when we, who are charged with authority as to the adoption of laws and the formation of tariff bills, attempt to amend them we should know that we are touching the business of the country and probably affecting its prosperity.

"Now, reforms are all right, and I am as much in favor of them, if I see that they are real reforms, as anybody, but the thing that makes most for happiness is good business and prosperity.

POOR NEED THE PROSPERITY

I have no doubt I am looking on men here who are fortunate in business, who can live through hard times and be comfortable just as they are now, but the people who suffer from a lack of prosperity, who suffer from hard times, are the wage-earners and the poorer people in the community. It is they who need prosperity in order that their children may have shoes, good meals, live well and be educated. What I wish to emphasize is that it is the business of the Government, where it attempts to amend, to change, or to revise a law that affects the business of the country, and affects it most intimately in such a way that it may cause disaster to business—it is necessarily the duty of the Government, and by that I include all branches of the Legislature, the House, the Senate and the Executive, for he plays some part in legislation—to inform itself as to what the law which it is proposed to pass is going to do with business, to know whether it is going to hurt business or not, and that to adopt a law on the theory of the rule of thumb, without understanding where it is going to hurt and whom it is going to injure and whom it is going to help, is to fly in the face of Providence, and it is not statesmanlike.

We are not all born to be cotton merchants or cotton manufacturers, and what we don't know about cotton manufacture will fill a great many books; but there are methods of finding out through other people—of delegating to other people the investigation of that subject, and to find out what the exact facts are. If knowing the facts, you wish to destroy an industry, because you think that industry ought not to be encouraged, or because it costs too much in the way of high prices paid for goods—if you want to wipe it out, then you do it knowing what you are doing, and the people know what you are doing and why you are doing it. But it is not right that we should treat the industries of this country without an intimate knowledge derived from expert information as to what the effect of these laws will be which we propose to pass revising the tariff, which so much affect the business and the business prosperity of this country.

KEEP THE TARIFF BOARD

Now I am advocating that argument in favor of a tariff board composed of experts who will give everybody an opportunity to be heard, and then will make up its mind as an independent quasi-judicial tribunal and make its report to Congress so that it may understand matters. That is what I am in favor of, and I hope you are. I hope it strikes the business men as a useful thing to do, to know where you are going to put your foot before you put it down, in order to calculate what the effect may be.

Of course it is said by some, why it is only for

the purpose of raising revenue anyhow. It is not to be directed to helping along artificially any industry if this theory is ultimately passed upon. It is easy enough to write a law of that sort. That is the simplest kind of a law to write, but if you are going to treat the industries that exist with a cherishing hand, so that they may continue to exist, and you believe in diversified industries, in order that we may have this country able to meet every requirement within the country itself, in other words—if you are in favor of a protective tariff, then we must know what we are going to do when we come to revise the tariff, and we ought not to go about the work with blacksmith's tools and hit here and hit there without understanding what the effect of each blow may be.

John E. Sirrine, of Greenville, S. C., presented his paper on "Modern Mill Construction."

MODERN MILL CONSTRUCTION

By J. B. Sirrine, Mill Architect and Engineer, Greenville, S. C.

In the beginning of the development of any great manufacturing industry, the first period is usually one of many and radical changes, not only in the character of product, but also in the tools or machinery necessary to produce it. A most marked example of this is now going on in the automobile industry, which for the past ten years has practically not only redesigned its product, but has virtually consigned to the scrap heap the original machinery installed. Naturally the enormous development charges incident to the business reflects itself in the high price of the product, and only when such a stage is reached that the manufacture is standardized, will the article be reduced to a commercial basis.

This expansion and development occurs in the history of every manufactured article, whether it be a complicated machine with an enormous number of parts, or a simple article of homogeneous character, such as cotton cloth or yarns. Happily, the textile art has passed through its earlier stages, and has come at last to such a high degree of standardization that practically the same price is obtained by each manufacturer for the same article produced at the same time.

To a certain extent this standardization is also likely to lead to stagnation, for the reason that the margins of profit are so reduced that very few mills believe they can afford to make extensive alterations or extensive changes in plants already equipped and in fair condition with respect to their neighbors in the same industry.

It is also to be questioned whether there is any serious likelihood of a radical change in textile machinery as we know it today, and, therefore, the present outlook seems to offer very little in the way of serious departures from the accepted process of manufacture. It is then upon the small improvements that we must depend for any decrease in manufacturing cost, and it is to the elimination of small wastes and upon slight increases in production that the manufacturer must now look.

The first step which any mill engineer takes in the preparation of his plans is to select a site where foundations, drainage, light and air are to be had to the best advantage, and also where economy of cost can be reduced to a minimum. Following this he must arrange the various buildings which make up the plant, in such a way that the product will not only require a minimum amount of handling but also that it will travel in one direction as far as possible, and not cross itself or interfere with the progress of other work which is in a different stage of manufacture.

There is very little use in elaborating the necessity for an economical site on which to build a plant, as the local conditions to a large extent fix this, and it need only be said that every mill, as far as possible, should be kept out of a valley or hollow. If the plant is to be run by steam it is usually very much cheaper to pump the necessary water supply than it is to attempt to build within reach of the stream, and thereby entail large expense in the way of foundations. As a general proposition all the space below the usable floors is wasted, and where high basement walls are built, the money going into them is an unprofitable investment. In addition to these objections to a low or very badly sloping site, this condition almost always enforces an uneconomical arrangement of buildings, and seriously interferes with the light and ventilation which are vital to the proper operation of the plant.

Having arranged the plant to this end, the machinery must be suitably housed, and here perhaps as much as any other place, there is a large amount of improvement possible over the conventional type of mill.

In the selection of materials for mill buildings up to a few years ago there has been little room for doubt as to which was the most economical. At that time a good quality of brick could be obtained at a low price and long leaf pine timber was both abundant and cheap, so that brick walls and hard pine floors were generally accepted as the standard materials with which to build a mill. This was rightly so for the reason that the use of reinforced concrete or of steel was prohibited by the tremendous difference in cost; but we are now rapidly approaching the point when they are so near together that the increased value of more stable floor construction is sufficient to offset the extra cost.

It has been generally urged that no special advantage in the cost of insurance can be gained by the use of non-combustible material for mill floors, and if this were the only saving undoubtedly those who oppose any change in the conventional form of construction would be right. It has also been axiomatic that machinery would wear out within a few years, or be so changed in its form that the obsoletion feature would render it unprofitable to use for a long period of time. The writer believes that in future the changes in the general type of mill machinery will be almost entirely in the line of small improvements, most of which can be applied to machinery already in use, and, therefore, he sees no reason why it should be necessary to hasten the wearing out of machinery by the refusal to place it on the proper kind of foundation.

With the class of lumber now obtainable at any reasonable price, and in fact with any class of lumber it is almost certain that within a few months after being installed, all machinery in a mill will be out of level, due to the unequal sagging of floor timbers, and this process of change in the floor levels increases with the age of the mill, so that at no time except the first few weeks after releveling, is the machinery running truly in its bearings, which of course, means a very rapid wear on all moving parts, and a consequent unsteadiness throughout the whole machine.

With the exception of the loom (which is a self-contained machine having only two bearings to each of its various shafts) all textile machinery has a number of points to support, and, therefore, to maintain the alignment, it is necessary that these machines be set on an unyielding floor.

There are many varying opinions as to the relative advantages of steel beams versus concrete as framing for mill floors, and undoubtedly there are places where each has its advantages. If the mill is to be mechanically driven and there is a large amount of shafting to be provided for, it is much simpler to use steel beams, since no accurate layout of the shafting has to be made in advance, and the location of shafting hangers may be readily changed at any time.

There is, however, a very serious objection to their use from the standpoint of damage from fire, as under a fairly high heat they will take a permanent set that cannot be removed. It will not be very long before the insurance companies will insist that all steel beams be fireproofed and when the expense of this is added, it will be found that their cost is prohibitive. Ordinarily, where steel beams are used, it is in conjunction with hard pine flooring and while the deflection of the floor plank is small as compared with that of a long beam, at the same time it lacks the rigidity of a concrete floor and therefore it is the writer's opinion that it is very much better to incur the additional expense necessary to secure a concrete floor.

It is getting to be more and more difficult to secure a satisfactory quality of brick at a reasonable price, and the point is now about reached where there is very little difference in cost between the ordinary brick wall and a skeleton type of reinforced concrete wall, with all the advantage of light in favor of the latter.

The difference in cost, if any, against the reinforced concrete, will soon be wiped out as contractors become more familiar with this type of construction, and by standardizing the work reduce the cost of forms. It is, therefore, altogether probable that within a few years the majority of new mills will be of the reinforced concrete type, having large window areas and consequently better lighted interiors. It is also highly probable that with the increasing size of the new plants that are being built, the introduction of electric transmission will be more common, and many of the disadvantages of this type of building, in enabling changes to be made in location of machinery, will be overcome.

This class of construction is perhaps the most adaptable to general conditions of any that has ever been used in industrial work, and it has the further advantage of making it very difficult to get holes through the floor, thereby reducing the danger of fire getting out of the room in which it starts. The indestructibility of concrete has also led largely to its use for basement, window sills, outside platforms and steps, both around the mills and in the warehouses, and with the class of lumber available today, this is a very important item. The writer has seen many instances in the last few years where outside platforms have been practically destroyed within four or five years, which makes the depreciation charge a big interest on the cost of permanent concrete structures. It is not surprising, therefore, to find that a great many of the larger mills who have gone into the question, are now having all renewals of outside steps and platforms made with concrete.

One feature of mill construction which in the past, and especially in the South, has received very little attention is the plumbing and general sanitary arrangements. It has been the custom to very frequently incorporate the toilet rooms in the main body of the building where neither light nor proper ventilation was available, and as practically all of the inside partitions were of wood, the toilet rooms were soon in such a condition that they are not only extremely offensive, but really dangerous to health. In some States where the factory inspection laws are very rigid, this matter has received conscientious and close attention, but in a great many places and especially in some mills that were built without the attention and care of an engineer, the conditions of the toilet rooms was indescribable and absolutely indefensible. Fortunately, there is a great change for the better in this respect, and the modern mills of today are devoting a great deal of time, and are spending more money to make these quarters not only well ventilated, but so arranged that they can be kept perfectly clean.

The only way to properly do this is to have as little wood as possible in the toilet rooms, and to have all the fixtures enameled inside and out. Where woodwork is used it should be painted with enamel paint, and so arranged that the frequent washing of the rooms will not rot the woodwork. The floors should be absolutely impervious to water and should be pitched to a drain so that it will be possible to get into the room with a hose and wash down every part of it. Sanitary drinking fountains are now being introduced in a good many mills, thus discarding the use of a common drinking cup or glass, for use of all the operatives. While it is often necessary to locate drinking fountains near the toilet rooms, they should not be placed in them, and a ventilated passageway in all possible cases should be placed between the toilet rooms and the main body of the mill.

After completing the design for buildings the mill engineer's next work is in planning a proper generation and distribution of power, and in this department perhaps more than any other, there has been more general disagreement as to the most economical method of transmission.

If power can be purchased from a power com-

pany at a price that will make it profitable to the consumer, there is of course no necessity for going to the expense of a power plant, and in estimating the cost of steam power there should always be taken into account the interest and depreciation on the cost of the plant as well as the amount of fuel required to operate it.

In a mill where steam must be used for dyeing in such a quantity that all of the exhaust from the engine can be utilized, there is no question about the economy of installing a steam plant. In this case unquestionably, power can be produced and the exhaust steam can be used for all purposes connected with the dye house, with a very little more cost for fuel than would be necessary if no power were used, and no power company could possibly afford to sell power as cheaply as it could be produced in this manner.

In the majority of mills, however, the use for exhaust steam is very slight, and it is therefore necessary to use condensing engines and to get the economy to as high a point as possible without utilizing any of the latent heat of the steam after it has done its work in the engine. Sometimes the question of whether or not it is better to purchase power or to make it becomes a commercial question affected quite as much by the financial strength of the mill as by the relative economy of the two methods of securing power.

If a mill has sufficient capital to undertake the building of a steam plant without impairing its resources, then it is only fair to count the actual interest on the money invested, plus the depreciation, but as it sometimes happens it becomes necessary to decrease the amount of textile machinery which they might install in order to have funds available for a power plant, and it is then a question of how much return could be obtained from this money if it were invested in additional textile machinery.

It will at once be apparent that this is a question that each mill must settle for itself, and that no general rule can be laid down for the solution of it.

FLASH LIGHT PICTURE TAKEN AT THE DINNER OF THE BOARD OF GOVERNORS

If it is decided that a power plant must be built, the next question to be determined is the method of transmission, and on this question the writer has always believed that each individual case must be studied out for itself, and that both mechanical and electrical transmission has its advantages, and that neither one nor the other is always the best thing.

In a small compact mill where the buildings practically comprise one unit, it is almost certain that the mechanical drive will be so very much cheaper, that any advantages gained by electric transmission will be more than offset by the added cost. This is especially true in the group system of motors, for the reason that the speed regulation will be very little, if any, better than with a prop-

erly designed mechanical transmission system, and the writer wishes to go on record here as saying the only advantage of electrical transmission is that a proper application of it may result in a more uniform speed in the various departments. From his experience, however, he would most unhesitatingly say that no saving in power can be accomplished by the use of electric distribution where the buildings are compact, and with the group system of drive it is very questionable in his mind whether the average case will show any better results in speed regulation than can be obtained in a mechanically driven mill.

There are, of course, a great many cases where a manufacturing plant consists of a number of buildings that must necessarily be scattered. In this case, unquestionably, the electric drive is of great advantage and should be used.

The scope of this paper is too general to allow space for the exhaustive treatment of a proper design for a steam plant, nor is it possible to lay down any general rule as to the proper class of apparatus to be selected.

There are, however, a few things which should be borne in mind in the selection of apparatus for power plants and which are also frequently disregarded.

In the selection of boilers, the size of the plant must necessarily be considered in fixing the number and size of units to be installed, but it should always be possible to lay off at least one boiler without stopping the plant or materially impairing its efficiency. Proper cleaning and care cannot be had without this, and although it is not commonly so regarded, in general any waste of fuel is more likely to be found in the boiler room than in the engine room. Small differences in valve settings may slightly affect the economy of the engine, but the amount that can be saved by extra care of the engine may be thrown away ten times over by allowing the boilers to get dirty, or by not having proper draught.

The way the boiler is set also affects its efficiency to a very large degree, and this is in turn affected by the kind of fuel to be used.

If mechanical drive is used it will, of course, be necessary to install an engine, but with electric transmission, it is very often a question of engines versus steam turbines, and here again the services of an expert are needed to determine which of the two is best adapted to the conditions. Each has its advantages and each is capable of good economy when properly installed.

It is best, however, not to consider steam turbines unless adequate condensing facilities are provided, for the reason that a steam turbine cannot give a high efficiency except with a good vacuum and as a general proposition it is not wise to install one unless the back pressure can be reduced to four inches which is equivalent to twenty-six inches vacuum referred to a barometer at thirty inches.

There are, of course, many ways of installing condensing apparatus to attain this result, but with a very small supply of fresh water and the consequently high temperature of the injection water, the cost of installing a condensing apparatus of sufficient size to give the necessary results, and the added cost of circulating sufficient water to get the desired vacuum, will, as a rule, more than offset the difference in first cost between the two types of machines.

After selecting the type of both boilers and engines, or turbines, as the case may be, they should be installed in such a way that there will be as little loss as possible in handling the steam from the boilers. In a modern plant only high pressure pipe and fittings should be used, and long bends should be installed in all main steam lines. All steam pipes should be properly proportioned in sizes for the amount of steam they carry, and should be thoroughly covered. All piping systems should be as simple as possible, but must at the same time be so installed that flexible operation can be secured. Heaters and feed pumps should be of ample size, especially the latter.

The plant as a whole should be so arranged that care of the apparatus is easy, and no pumps, heaters, etc., should be placed in a dark place. The design and arrangement of a power plant is necessarily a very complex question and one which, unfortunately, has often been neglected. It should be constructed only by an expert who has an organization capable of handling every detailed question in connection with it, and who is able to take into account all of the conditions, both favorable and unfavorable, that affect any type of apparatus under consideration. The power plant is, after all, the heart of the mill, and after being installed it is called upon to give hard and unremitting service, and whenever it stops everything must stop. The first consideration, therefore, is reliability, and after this economy. Fortunately, as a general proposition, the economical plant can be made the most reliable one, and it is not, therefore, necessary to sacrifice one point for the sake of gaining the other.

The steady load of a cotton mill is ideal for the economical development of power, but it should also be borne in mind that this steady load means running everything "at the top notch" all the time without any long shut downs during which repairs can be made. Therefore, all apparatus should be selected to give steady and uniform service and be capable of standing up under the load every day.

In buying apparatus it should always be remembered that what is economical in one plant, under one set of conditions, may not be economical in another plant under entirely different set of conditions, and that these conditions may vary without the knowledge of the purchaser, unless he be an expert, which is not usually the case. Therefore, by all means, the services of a high class engineer should be secured, and it would be surprising, indeed, if he fails to save his fee a good many times over in the results which he is able to accomplish as against the man with only a general knowledge of the subject.

In order to determine accurately the difference in speed regulation between the various types of drive, there was recently conducted by the writer's office a series of tests in various mills, to determine the actual losses in daily operation by the

various methods of transmission. This series of tests comprises something over three thousand readings, and were made in mills of the highest class of construction; therefore the average results are probably better than would be found in many plants. Tests were made with carefully calibrated tachometers, except that some loom speeds were taken by means of the stopwatch, reading the actual seconds for a given number of picks. These tests show only the variation in speed between the machines in the same department and at practically the same time. They do not show the day to day variations such as might be caused by the effects of change in humidity and temperature on the main driving ropes or belts, counters and machine belt or the change in speed of prime movers.

The per cent. loss is figured in the following manner: The maximum speed is taken as the speed of the highest reading machines, not on some accidentally high reading, but on a maximum established by several machines. It is assumed that all machines should be theoretically run at this maximum speed. From this maximum speed is deducted the average speed of all the machines tested. The difference between the two readings divided by the maximum represents the loss in the room in per cent.

It will be seen by closely examining this test that the average variation in speed in the mills using large group motors in their spinning room, was practically as high as that found in the mechanically driven mill operating under about the same conditions. This is to be expected, as there are really no fewer belts in the one case than in the other, and the only extra transmission is the rope drive from the engine to the main shaft where the slip is very small and subject to practically no variation. It will be noted that the "Four Frame Drive" for spinning shows a very much better average speed than either the mechanical or electrical group drive, and this is, of course, to be expected for the reason that there is only one belt between the motor and the frame.

It should be borne in mind that these tests were made in high class mills receiving careful attention, and do not represent really an average type. It can be safely stated that in many old mills with overloaded belts and very poor attention, the loss in speed may amount, on individual frames, or on even a large majority of the frames, to as much as 10 per cent.

In one mill where tests were made by the mill people, and which were not of sufficient extent or accuracy to enable us to use in this paper, there were found in one spinning room individual frames running as low as 22 per cent. under speed, and the average in the room, both warp and filling, was 8 per cent. under speed. This is a mill built about twenty-five years ago and which has been added to from time to time without changing many of the main driving belts. It, of course represents an extreme but by no means unusual type, and attention is called to it to stress the necessity in designing a new plant, of having sufficient belt capacity on all drives to reduce slippage to a minimum. There is no secret of cheap cost except high production, and every minute that a machine runs under the speed at which it ought to operate, the cost is piling up and the number of yards or pounds upon which the mill may make a profit is also reduced, and, therefore, the loss is not confined alone to the increase in cost of production.

The writer would unhesitatingly say that he believes there is not a single plant in the United States, unless it be driven with individual motors geared to each machine, that has not an average speed loss in all departments of more than 2 1/2 per cent., and he further believes that the greater part of this loss is in the weave room where it really does the most harm.

In the matter of lighting the mill, there are several systems that may be employed, each of which has its adherents, and each of which has some

GROUP PICTURE TAKEN IN THE WHITE HOUSE GROUNDS BEFORE THE PRESIDENT'S RECEPTION

special advantage. The system, however, in most general use today is high efficiency Tungsten lamps, which are hung at some distance above the floor and provided with the proper kind of reflector, so that a general illumination may be provided over the entire room. The lighting system should be divided into circuits, so that those parts in the mill that are darkest, may be lighted in advance of the others. It is, therefore, usual to provide three circuits in each main room, divided through the length of the mill. This gives one circuit on each side of the room nearest the windows, and one in the center, as on many dark days artificial light may be needed in the center of the room, and not on the sides. This method enables the proper light to be maintained without having to burn all the lamps in the room.

Proper care should be taken not only to so arrange the wiring that a uniform voltage shall be maintained at all lamps, but the lamps themselves should be purchased for the exact voltage at which they are to be used. For example: If a 115-volt lamp is put on a 110-volt circuit, it will not give its full candlepower, whereas if a 110-volt lamp is put on a 115-volt circuit, its life will be very materially shortened. This, however, is a matter which is more commonly neglected than attended to, and as a consequence many mills fail to get any decent results from their lighting system, and are only content to let the matter go on as it has been, because they do not know better.

In the matter of heating and moistening, there are so many systems that the writer prefers to pass this question over as briefly as possible, since he does not wish to show partiality for or against any particular system. He would, however, stress the point that both the heating and moistening systems should not only be adequate under normal conditions, but should have sufficient capacity to give the proper results under the most extreme conditions. Unfortunately, many mills are content to start out with a cold room in the morning, provided they can get it warm by 9 o'clock, and do not stop to think and take into account the loss of production which this entails. The mill should not only be at the proper temperature at the starting hour, but should be maintained at this temperature with reasonable accuracy during the entire running time, and to obtain this result there must be ample radiation, whether heating is done by steam coils in the mills or by the fan system. In all cases, if the radiation is sufficient it will be found economical to use a vacuum pump on the returns, and to do the heating at low pressure. Moistening systems should not only be ample in size, but should be so arranged as to secure proper distribution.

In a recent test made for humidity in a mill that was having trouble with kinky filling, it was found that the relative humidity in the spinning room under severe conditions could not be brought above 26 per cent., notwithstanding the fact that the management were quite sure that the deficiency in humidity, if any, amounted to very little. The humidifier system has been completely overhauled, and, in fact, entirely renewed since that time, and there has been no difficulty with kinky filling, and the actual output of the room has increased over 5 per cent. Possibly some of this may have been due to regain of weight in the yarn, but part of it was due to the ability to reduce twist on the spinning frame, and thereby increase the front roll speed. It has been customary in the past to sell humidifiers on guarantee to produce a certain humidity in each department, with certain temperatures in the room, and with all the windows closed, and it is doubtful if one mill in ten makes any test after letting the contract.

It is a well known fact that it is almost impossible to keep the windows closed in certain seasons of the year when the humidity is lowest, and therefore while technically the guarantee has been filled, the amount of humidity is not sufficient for proper operation. A great many buyers also are governed entirely by the price made on an installation, without any checking up of the number of gallons of water evaporated by the system. Therefore, it may easily happen one firm may be putting in a system of very much smaller capacity than another, and for that reason is able to make what is apparently a better price, whereas, if compared on the proper basis, it would be really higher. It is the writer's practice to make each bidder specify exactly the number of gallons of water per hour which his system will evaporate so that an exact comparison of capacities can be made.

In presenting any general article upon a subject so broad as that given for the title of this paper, the author must necessarily turn toward some concrete example of the subject he seeks to illustrate, and to point out in this example the various steps that have been taken and the precautions that have been observed to accomplish the desired end. The writer, therefore, desires to apologize for a lengthy description of the Dunean Mills at Greenville, S. C., which has recently been designed in his office, and which represents a splendid type of modern mill construction.

In every department of the construction or equipment of any manufacturing enterprise there must be considered at all times the commercial practicability and advisability of each item which is to be purchased. In other words, in a manufacturing plant no expense which does not lead to a dividend either directly or indirectly can be justified, and it is with this fixed idea in view that the Dunean Mills have been constructed.

This plant is located about 1 1/2 miles southwest of Greenville, S. C., and is equipped for the manufacture of fine fancy dress goods. It has 50,320 ring spindles and 1,200 looms, of which part are Jacquard and the balance 20 harness dobbies. It is electrically driven by current purchased from the Southern Power Company.

The site is a peculiarly favorable one and splendidly adapted to convenient arrangement and economical construction of buildings. It is on a high plateau, the top of which is nearly level, there being only enough slope to give the proper drainage.

The general arrangement of the plant is shown in the accompanying pages marked "Fig. 1," and it is generally as follows:

Carding and spinning is in the main building, 471 ft. 8 in. long by 130 ft. wide, two stories high. One hundred feet west of this and parallel to it, is the weave shed, which consists of a one-story

building 403 ft. 4 in. long by 209 ft. wide, lighted both by windows on all sides and from nineteen saw-tooth skylights in the roof, each running entirely across the building. There is a basement in the weave shed of sufficient height to enable proper inspection of the wiring to be made, but there is no shafting in this basement. At the north end of the weave shed and twenty-five feet distant from it, is a two-story cloth room building, the first floor of which is on a level with the weave room floor, and in which is located the stitching, brushing and shearing machines. These occupy only a small portion of space, the balance being devoted to storage. (See Fig. 1, in back.)

The construction of this mill is unique in that while all floors carrying machinery are of the most rigid type, the favorable conditions of the site have been utilized in such a way as to keep the cost of the building very close to that of the conventional type.

The first floor of the main building rests on 4 1/2 inches of tar concrete, on which is placed one layer of 3 in. square plank and a 7/8 in. maple top flooring. At the north end of the building the first floor is of reinforced concrete, under which is the dust room and machine shop. (See Fig. 2, in back.)

The entire second floor of the main mill which carries the picking and carding, is reinforced concrete. This floor has been tested with a load of 400 pounds per square foot and shows a maximum deflection under that load of 1/4 in. at the center of the spans. Inasmuch as the load in actual practice will probably not exceed 80 pounds per square foot, it will be seen that there will be practically no sag under normal load, and that whatever deflection exists will be a permanent one. (See Fig. 3, in back.)

The roof on the main building is of the conventional mill construction type, with wooden beams and a 3 in. roof plank.

The arches ordinarily used over the top story windows are omitted and the window frames are carried to the under side of the roof plank. The light in this room is further increased by a monitor 25 ft. wide by 5 ft. high running practically the full length of the building.

The weave shed floor is carried on hard pine beams covered with 4 in. plank, 1 in. of intermediate flooring, and 7/8 in. maple top flooring. Intermediate piers are used under the floor timbers in the weave shed, thus reducing the deflection of the floor timbers to about one-fourth the usual amount. (See Fig. 4, in back.)

The cloth room building is of mill construction type and inasmuch as all heavy loads are carried on the bottom floor of this building, it was possible to reinforce this floor as was done in the weave shed, with very little expense. (See Fig. 5, in back.)

The warehouse is the regular standard type of two-story building arranged to store one bale on end in each story. All platforms at this warehouse are of reinforced concrete, as are all outside steps and platforms on the mill buildings.

Next to the warehouse is located a brick opening room in which all cotton is opened and fed through an opener to the picker room.

The writer claims no special feature of construction in this mill, that has not been used before, but he believes that the combination of the various types has produced all that could be desired in the way of results and with a minimum of cost. Notwithstanding the fact that the character of work in this building is of the very best, the total contract prices of the main building, including the main mill, weave room, cloth room and boiler house, amounted to only 81 cents per square foot of usable floor surface, which he thinks will compare very favorably with buildings of the conventional type and of a similar arrangement.

In the transmission of power this mill is unique in that so far as the writer knows, no cotton cloth mill in the United States has ever gone so far with the application of individual motors to textile machinery.

Not only are the pickers and spinning frames equipped with individual motors, but each loom has its own motor as well.

The group drive was used in the card room for the reason that special motors have not been as yet developed for card room machinery, and the application of small motors in this room would be of doubtful value and subject to too much expense to warrant their use.

Before determining on the use of individual motors, forty of them were installed in the Watts Mills at Laurens, which is on fine nainsook cloths, and which is under the same management as the Dunean Mills. The results there show conclusively that the loom production was increased about 2 1/2 per cent., and that the quality was much better, due to the fact that the uniform speed gave a more accurate spacing of the cloth threads, which on a belted loom varies considerably.

In laying out the plans it was the endeavor to have every part of the electrical equipment not only standardized as far as possible, but also to make it of the most permanent character, and in order to do this all of the main wiring is carried in tunnels underneath the floor, which tunnels are accessible from the outside of the buildings and are large enough to allow inspection and repairs. All of the interior wiring is carried in iron conduit, including the lighting wiring.

Power is received from the Southern Power Company at 13,000 volts, and is stepped down in an outside fireproof transformer house to 230 volts, at which pressure distribution is made. This voltage was determined on because of the fact that the electrical and mechanical characteristics of the low voltage motor are better than that of the high, and also because of the fact that the motors are better developed in the small sizes. The writer pauses here to say that no standard motor in small sizes should be used for textile work, as it requires a special treatment and, therefore, the purchaser should get a motor specially developed for the service which it is required to give.

Inasmuch as this paper is intended to be generally descriptive, and not a treatise on electrical apparatus, no detailed description will be given of the various motors, except to say that all of them are conservatively rated and are built especially for textile service.

It may be interesting to give a general description of the course of the product through the plant, since it illustrates the point previously made

that the work in a modern mill should progress continuously in one direction as far as possible.

Cotton is delivered from an opening room at the warehouse through a 14 in. galvanized iron pipe to the picker room, which is on the second floor at the north end of the main mill. The laps pass from the pickers directly through the cards, drawing, slubbers and roving machinery, moving southward and finish in the form of fine roving at the south end of the mill. From this point the roving drops one story to the spinning room, which is located on the bottom floor, the filling spinning being on the west side and the warp on the east. The elevator at the end of the mill handles loads only in one direction and comes back with empty bobbins. The warp yarn is carried to the north end of the mill through the spoolers and warpers which are at the end of the mill and from the warpers goes through a passageway to the slasher room and tieing-in room, which is in the north end of the weave shed. The filling yarn goes through a passageway located about the middle of the length of the mill, to a conditioning room on the east side of the weave room and about the middle of its length. From this conditioning room the yarn is carried directly into the weave room, coming, as stated above, just about the center of its length. Finished cloth is carried through a short passageway to the stitchers, brushers and shearing machines, which are located on the first floor of the cloth room. From these machines the cloth passes up through the floor over rollers, without handling, to the inspecting machines and folders. This cloth room building is 50 by 209 ft. and is specially well lighted. The brushers and shearing machines being located on the floor below, there is absolutely no dust or lint in the room where the cloth is finally inspected and baled, nor is there any shafting that could possibly throw oil on the goods. From the cloth room goods are loaded from a loading platform on the north side of the building.

From the above it will be seen, clearly, that there is no crossing of this work, nor any handling that is not absolutely necessary, from the time the cotton is opened until the goods are packed in the car.

Reduced photographs of the machinery plans are shown herewith, which will give a very good idea of the layout.

The construction and equipment of this plant was done by the following parties:

Building Contractors—Fiske-Carter Construction Company, Worcester, Mass., and Greenville, S. C.

Pickers—Kitson Machine Shop.

Cards, Drawings, Roving and Spinning—Saco-Pettee Company.

Combers—Whitin Machine Works.

Spoolers—Saco-Pettee Company.

Warpers—Lowell Machine Shop.

Twisters and Slashers—Lowell Machine Shop.

Looms—Crompton-Knowles Loom Works.

Cloth Room Machinery—Curtis & Marble.

Fire Protection and Heating—General Fire Extinguisher Company.

Electrical Machinery—General Electric Company.

SPEED TESTS—SUMMARIES

SPINNING FRAMES

Mill	Per Cent. Loss Warp	Filling	Room	Prime Mover	Drive
A.	2.56	.81	1.68	Engine	Mechanical Counters
B.	2.50	1.10	2.03	Engine	Mechanical-Counters
C.	2.50	1.42	2.40	Engine	Mechanical-Counters
D.	4.03	.51	2.16	Engine	Mechanical-Counters
E.	2.52	1.92	2.20	Engine	Mechanical-Counters
F.	1.92	2.09	2.00	Engine	Mechanical Single Guide Two-Frame Belt
G.	2.89	1.24	1.87	Hydro-Electric	Large Group Motors Counters
H.	1.62	.86	1.24	Hydro-Electric	Four-Frame Motor
I.	.88	1.09	.98	Hydro-Electric	Four-Frame Motor
J.	1.35	.79	1.05	Hydro-Electric	Four-Frame Motor

LOOMS

Mill	Picks Max.	Min.	Avg. Loss %	Variation %	Prime Mover	Drive
K.	164.0	150.0	4.14	8.5	Hydro-Electric	Large Group Motors Counters
L.	109.0	102.0	3.00	6.5	Hydro-Electric	Large Group Motors Counters
M.	160.0	148.0	4.22	8.1	Hydro-Electric	Large Group Motors Counters

EFFECT OF CLEANING BELTS ON WARP SPINNING FRAMES. TEST MADE OF 26 FRAMES. MILL "M"

	Rpm.
Average cylinder speed before cleaning belts	1157
Average cylinder speed after cleaning belts	1177
Gain by cleaning belts, average 1.7%.	
Minimum speed before cleaning belts	1109
Minimum speed after cleaning belts	1142
Maximum speed before cleaning belts	1189
Maximum speed after cleaning belts	1202

Humidifiers and Regulators—Stuart W. Cramer.
Shafting—Jones & Laughlin.

Before closing this paper the writer desires to express his thanks to J. Adger Smyth, Jr., president and treasurer of the Dunean Mills, for permission to reproduce the machinery plans and also for his intelligent appreciation of the writer's efforts to make the plant an efficient one, in which he has been so ably assisted by the management.

[The plans to which reference is made in this paper can be obtained upon application to the association.]

The closing session of the Convention on Thursday morning, April 4th, was attended by a very large number of members, as it was expected that the reports of the various committees might arouse considerable discussion, but the differences of opinion had been thrashed out in the committee meetings so that the reports were adopted unanimously, and the best of feeling prevailed. At the opening of the session Mr. Cone asked permission to introduce Joseph Fels to speak for a few minutes on the subject of single tax. Mr. Fels, who has achieved an international reputation through his advocacy of the single tax on land, gave a very lively fifteen-minute talk. He interspersed his remarks with bright stories, put the members in good humor, and made some strong points for his proposition.

The Committee on Resolutions presented the usual resolutions of thanks to those who had helped promote the success of the Convention.

In the report of the committee on Cotton Exchanges, which was submitted by Lewis W. Parker, the committee reported that they had been in communication with representatives of the New York and New Orleans Cotton Exchanges and had held a joint conference with the representatives of these exchanges and members of the National Association of Cotton Manufacturers in New York during the fall of 1911, at the New York Cotton Exchange. At this meeting resolutions were adopted advising certain changes in the rules of the New York Cotton Exchange and they were pleased to report that one important modification had been adopted by that exchange, that it had agreed to make an additional revision of differences about February in each year, being in addition to the revision made in November and September. This modification, it was believed, would have a tendency toward improving the relation of prices on the New York Exchange to spot prices; at the same time the committee did not believe that this single additional revision was sufficient. The committee regretted they were unable to accomplish more. At the same time they found that a majority of the members of the New York Cotton Exchange were wedded to their idols and not apparently appreciative of the injurious effect of their contract upon both producer and spinner.

In this connection the committee called attention to a recent letter sent out by one of the most prominent members of the New York Cotton Exchange reading as follows:

Owing to the higher standard of classification, and the system of commercial differences at New Orleans, New York differences were fixed last November for the balance of the season and cannot be changed until September 11. Old crop positions in New Orleans have been ruling for several weeks considerably over New York, present premium being 33 points on May and 24 points on July.

October contracts, on the contrary, have been selling at about the same price, or at only a slight premium in favor of New Orleans, at present two or three points.

We see no reason why the same influences that have brought about a premium on the old crop positions in New Orleans should not gradually extend to the early new crop months also, and we therefore advise buying in New Orleans and selling October here as straddle whenever it can be done at even figures or at a slight premium.

The committee reported that the anomalous position in which the New York Cotton Exchange was thus placed would be recognized at once, when it is admitted that although naturally the New York Exchange should have quotations higher than those of New Orleans, yet under the inferences of the rules of the New York Exchange prices absolutely prevail on a lower lever. A great injustice, continued the resolution, is thereby done to the producers of cotton throughout the South, as through the operation of the runs of the New York Exchange the apparent ruling price of the South's chief commodity is, as a rule, reduced below its real value.

A resolution was submitted deploring

proposed legislation against cotton exchanges. An amendment to this resolution was offered by Lewis W. Parker, the substance of which was as follows: That while the association recognized the need of cotton exchanges, it urged that there be no unnecessary hampering by legislation of these exchanges. The association renewed its earnest appeal to the New York Cotton Exchange to so amend its rules as to make them fair and equitable to both producer and spinner and make its contract prices in proper relation to spot cotton.

Among the other resolutions adopted were the following:

Resolved, Believing the difference between spot cotton in the South and the price of contracts on the New York Exchange is largely because the difference in grades as made by the Exchange are not arranged as frequently as the business interests demands, and believing that the interest of all concerned demands a rearrangement of the differences at least once every three months: we, the American Cotton Manufacturers' Association, petition the New York Cotton Exchange to so change their rules as to rearrange the differences as applied to grades at least once every three months, and the secretary of this association be instructed to forward such petition to the offices of the New York Cotton Exchange, with the request that early action be taken.

Whereas, the association favors the suggestion that a national council or committee be formed to represent the cotton manufacturing industry of the United States on matters of national importance.

Resolved, That the president of this association appoint a committee of three, of which he shall be one, to confer with the similar committee from the National Association of Cotton Manufacturers in relation to the formation of such a body and report in print their recommendation to this association at its next annual meeting.

Resolved, further, That the National Association of Cotton Manufacturers be requested to appoint a similar committee, with the above authority.

Resolved, That the question of rules for cotton buying seek some uniformity of action with manufacturers and cotton merchants, North and South, and establish rules that will be uniform and generally observed and alike fair to buyer and seller, and provided for the settlement of disputes without recourse to the courts, be referred to the joint committee of the two associations authorized at this meeting.

Resolved, That this association accept the invitation of the President of the Untied States and instruct the president of the association to designate one of their members as delegate to attend a conference in Washington, D. C., April 22, for the purpose of meeting a national commercial and industrial association.

Resolutions were adopted protesting against the misstatements in the report regarding conditions in Southern mills recently made to Congress, and thanking the Senators and Representatives who had spoken in rebuke of the report.

Appropriate resolutions were adopted by a rising vote in memory of the late Chairman of the Board of Governors, Charles D. Tuller.

Chairman R. M. Miller of the Tariff Committee presented the following report:

"On behalf of your committee on tariff and legislation I beg to submit as our report, bulletins 1, 2, 3 and 4, copies of which we present, and ask that they be accepted, approved and made a part of the records of the meetings.

"The committee assumes that the members are familiar with these bulletins, as a copy of each was mailed to every member of the association and also to every textile manufacturing establishment in the United States. Copies were also sent to the President and officials of the Government, to all Senators and representatives in Congress, to the press and to many individuals applying for copies as records.

"The committee recommends the adoption of the following resolution:

Resolved, First, this association at its May, 1909, meeting recorded itself as favoring the establishment of a tariff commission and now reaffirms that action.

Second, it now appearing from the preliminary synopsis of the report of the Tariff Board and from other investigations that in some instances duties on cotton goods are now excessive, owing to the changed condition in manufacturing.

Resolved, That this association records itself as favoring such reasonable revision of the cotton schedule based upon differences in the cost of production and other conditions at home and abroad as shall be consistent with the raising of revenue and the conservation of our home market.

"Personally and on behalf of the committee I desire to acknowledge our obligation to Mr. Cramer, a member of the committee, for his special interest in the work of the committee. His services were invaluable to me as chairman, and his time was always at the disposal of the committee. This acknowledgment the committee feels is due him and requests that the same be embraced as a part of the report."

Lewis W. Parker, in seconding the motion to adopt the Committee's report, said that in spite of some differences of opinion he commended the Committee for their efforts and hoped the Association would express its approval of their work by adopting the report, which was then accepted unanimously.

The nominating committee, through its Chairman, A. J. Draper, presented the name of W. A. Erwin, of West Durham, N. C., as President. Mr. Erwin served the previous year as Vice-President. He was unanimously elected and a committee was appointed to escort him to the chair, where he expressed his appreciation of the honor conferred upon him, and pledged his best efforts for the welfare of the Association. He complimented his predecessor for the good work that had been done and the progress that had been made during the past year in harmonizing all interests and welding the Association together for earnest, valuable work.

Stuart W. Cramer was nominated for Vice-President. His name was seconded by Lewis W. Parker, who spoke of the good work that he had done for the Association and expressed the hope and belief that the same success which had attended him in the past would follow him as a cotton manufacturer. He was unanimously elected.

In proposing and seconding the nomination of Secretary C. B. Bryant, his services were highly commended and the indebtedness of the Association to him for a large part of its success was gracefully acknowledged. A committee has been appointed to give tangible form to this sentiment of appreciation.

The following were elected as new members of the Board of Governors: T. I. Hickman, President and Treasurer Graniteville Mfg. Co., Augusta, Ga.; J. T. Broadbent, Agent Meritas Mills, Columbus, Ga.; James Maynard, President Brookside Mills, Knoxville, Tenn.; W. C. Ruffin, Treasurer Mayo Mills, Mayodan, N. C.; Alexander Makepeace, Superintendent Richard Borden Mfg. Co., Fall River, Mass.; J. D. Gossett, President and Treasurer of the Brogan Mills, Anderson, S. C. These gentlemen with the following constitute the new Board of Governors: Carroll Baldwin, New York, N. Y.; W. E. Beattie, Greenville, S. C.; W. T. Bryan, Athens, Ga.; Ceasar Cone, Greensboro, N. C.; Jesse P. Eddy, Providence, R. I.; Wm. E. Hooper, Baltimore, Md.; John A. Law, Spartanburg, S. C.; Scott Maxwell, Cordova, Ala.; T. L. Wainwright, Stonewall, Miss.

NEW MEMBERS WERE ELECTED AS FOLLOWS

Summerfield Baldwin, Woodward, Baldwin & Co., Baldwin & Co., Baltimore, Md.; Marion Brawley, Parker Cotton Mills Co., Greenville, S. C.; Edwin A. Cady, Treas., Warren (R. I.) Mfg. Co.; Benj. C. Chase, Jr., Agent and Gen. Mgr., Crown Mfg. Co., Pawtucket, R. I.; Joel D. Charles, Sec., Conestee Mills, Greenville, S. C.; C. W. Coker, Treas., Southern Novelty Co., Hartsville, S. C.; W. I. Greenleaf, Vice-Pres. and Sec., Ide Cotton Mills, Jacksonville, Ala.; Horace Johnston, Highland Park Mfg. Co., Charlotte, N. C.; Geo. H. Lanier, Vice-Pres. and Gen. Mgr., Lanett Cotton Mills, West Point, Ga.; J. E. Latham, Pres., Pomona Mills, Inc., Greensboro, N. C.; W. S. Lee, Vice-Pres., Southern Power Co., Charlotte, N. C.

Alex. Makepeace, Supt., Richard Borden Mfg. Co., Fall River, Mass.; Jno. M. Morehead, Vice-Pres., Leaksville Woolen Mills, Spray, N. C.; J. A. Odell, Pres., J. M. Odell Mfg. Co., Greensboro, N. C.; Theophilus Parsons, Treas., Lyman Mills, Boston; W. T. Rankin, Pres. and Treas., Ozark Mills, Gastonia, N. C.; W. F. Shove, Treas., Pocasset Mfg. Co. & Wampanoag Mills, Fall River; H. T. Whitin, Treas., Paul Whitin Mfg. Co., Northbridge, Mass.; E. R. Lucas, Vice-Pres., Walhalla (S. C.) Cotton Mills; A. S. Farmer, Pres. and Treas., Conneross Yarn Mill, Anderson, S. C.; H. G. Welborn, Vice-Pres., Olympia Cotton Mills, Columbia, S. C.; E. J. Braswell, Brown Mfg. Co., Concord, N. C.; Albert F. Bemis, Pres., Bemis Bros. Bag Co., Boston; H. H. Fukuhara, Kauegafuchi Spinning Co., Hiogo, Japan; F. K. Broadhurst, Sec. and Treas., Ivanhoe Mfg. Co., Smithfield, N. C.

H. G. Coe, Asst. Supt., Brookside Mills, Knoxville, Tenn.; J. Harper Erwin, Durham Cotton Mfg. Co., East Durham, N. C.; J. H. Webb, Eno Cotton Mills, Hillsboro, N. C.

Preceding the Wednesday morning session a meeting of the Soft Yarn Spinners' Association was held behind closed doors. The Hard Yarn Spinners' Association is another organization which has held several private sessions, and it is understod that its membership now includes a very large proportion of the spindles engaged in the production of hard yarns. W. B. Moore of Yorkville, S. C., is President of this Association, J. E. Hart is Secretary.

Adjoining the Convention Hall and the Registration Room was an interesting exhibition of cotton goods made in European and Asiatic countries, which attracted a great deal of attention from the manufacturers. Samples of a great variety of fabrics were shown, with all the data concerning the construction of cloth, selling price, etc., which have been collated by the Commercial Agencies of the Bureau of Manufacturers.

* * * * *

With characteristic enterprise the American Moistening Co., of Boston, rented a store on the ground floor of a building on the next street to the hotel, which was fitted up with a working demonstration of the Comins Sectional Head type of the American Moistening Machine. A special feature of interest was the new automatic controlling apparatus recently developed by this company, by which the humidity of any room in the mill may be maintained at a desired point without personal attention. The apparatus on exhibition was operating with a variation of one-quarter of one degree. A large recording dial showed the accurate work of the controller. This controller will be on exhibition at the Boston show later in the month. Frank B. Comins, the treasurer of the American Moistening Co., and his assistants, were kept busy by a throng of visitors.

* * * * *

In one of the rooms at the Hotel Raleigh the Franklin Process Co., of Providence, R. I., had an exhibit of yarn dyed in their machine by their special process. There were also samples of chambrays and other fabrics in which the yarn had been dyed in their machine, which has been described in these columns. Most of the samples were dyed with the new vat colors and their evenness of shade was a feature which was noticeable. The machine dyes yarn on cheeses or cones, the same machine doing the scouring as well as the dyeing. It can also be used for bleaching. John C. Hebden, the inventor and manager of the company, was in charge of the exhibit, which was visited by a large number of manufacturers. The company has recently equipped a plant at Providence and is doing work on a commercial scale on cotton and worsted yarn. It also sells its machines to manufacturers.

NATIONAL ASSOCIATION OF HOSIERY AND UNDERWEAR MANUFACTURERS

The following interesting program has been arranged for the meeting of this association at Philadelphia:

Opening session, May 7th, at 10 A. M.: Address by President Andrews; Welcome by the Mayor of Philadelphia; Annual reports by the president, secretary, committees and sub-associations; Address on "Lighting," by R. S. Demonger, of the General Electric Co.; Address on "Manufacturing and Selling Agent," by Charles Vezin, of Hinchman Vezin Co.

Afternoon Session, May 7th, 2.30 P. M.: Meeting of the hosiery sub-associations, 2.30 P. M.; Meeting of the Underwear Members.

Morning Session, May 8th: Only knitting manufacturers and associate members are admitted; Address by Hon. J. Hampton Moore of Pennsylvania; Reports from special committees; Address on "Modern Methods of Merchandizing," by S. R. Latshaw, of the Curtis Publishing Co.; Address on "The Use and Abuse of Special Packing," by W. W. Smith; Address on "Knitting and Cotton Mill Waste," by Felix Brecher, of G. Josephy's Erbon, Bielitz, Austria; Report of Cost Committee, by Robert C. Blood.

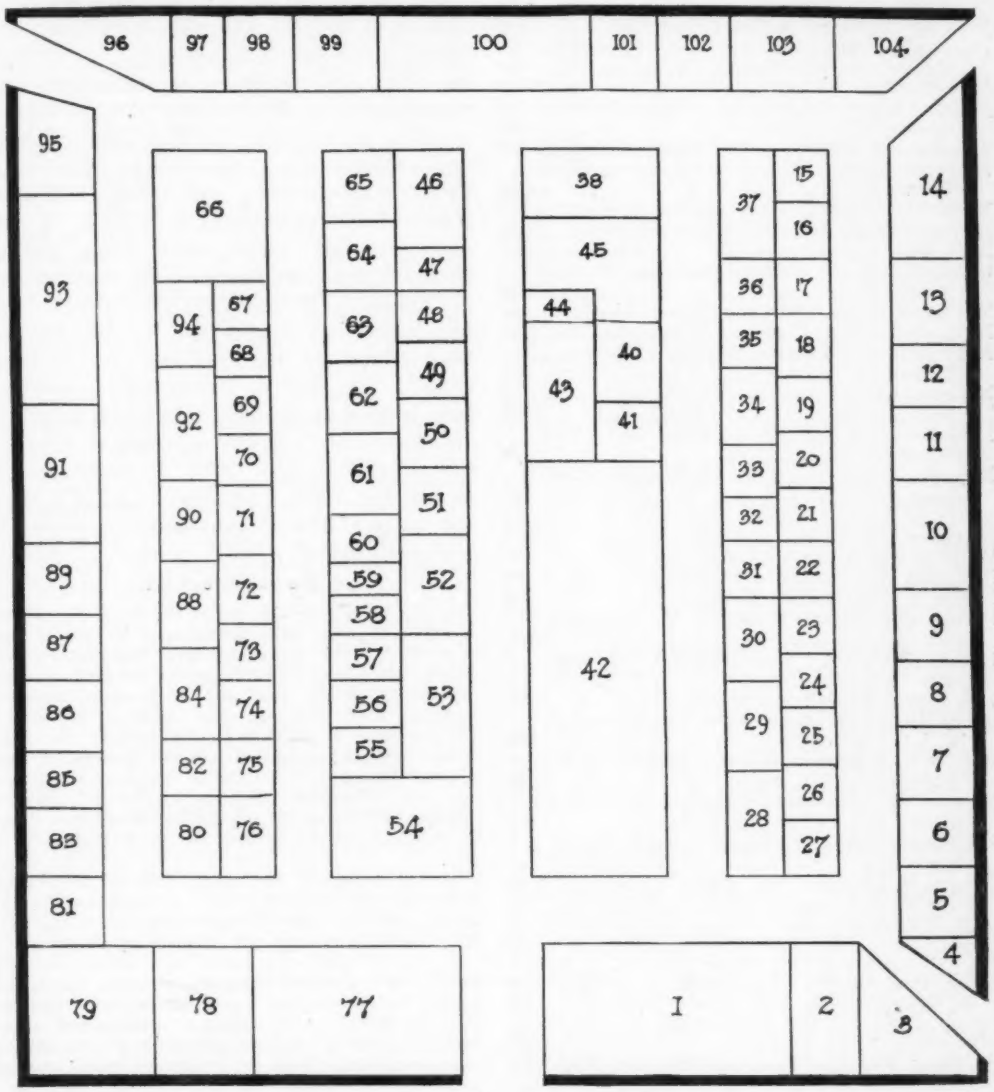
Afternoon Session, May 8th, 2.30 P. M.: Meeting of the underwear members, 2.30 P. M.; special meeting of the underwear members, 2.30 P. M.; meeting of the manufacturers of woolen hosiery, gloves, mittens, sweaters and fancy knit goods.

Wednesday evening, May 8th: Banquet and smoker.

Morning Session, Thursday, May 9th: For knitting manufacturers, 10 A. M. Admittance will be by card. Discussion of the following subjects: The net weight for yarn credit bureau department, collection department, cancellations and arbitration committee. Meeting for the associate members. Admittance will be by card. The ex-

hibition held in connection with this meeting will be held in the First Regiment Armory. The following is a list of those who have already arranged for space, the location being indicated by the numbers on the accompanying chart:

Charles Beck Company, Ltd., Philadelphia ... 16
Beckert Needle & Supply Co., Philadelphia .. 80
Berlin Aniline Works, New York City 82
Richard A. Blythe, Inc., Philadelphia 43
Charles Bond Company, Philadelphia 49
H. Brinton Company, Philadelphia 46
H. V. Butz, Philadelphia 73
Cotton Publishing Co., Atlanta, Ga. 33



Acme Knitting Machine & Needle Company, Franklin, N. H. 38
Acme Staple Company, Camden, N. J. 55
American Wool and Cotton Reporter, Boston, Mass. 104
Andreykovicz & Dunk, Philadelphia 71
Barber-Colman Company, Rockford, Ill. 59

Continental Latch Needle Company, New York City 32
Albert Ivins Croll, Philadelphia 85
George C. Decker, Philadelphia 58
Eastman Machine Company, Buffalo, N. Y. .. 41
John Eppler's Machine Works, Philadelphia .. 47
J. A. Firsching, Utica, N. Y. 40

J. B. Ford Company, Wyandotte, Mich. 13
General Electric Company, Schenectady, N. Y. 65
Grand Rapids Textile Machinery Company, Grand Rapids, Mich. 45
Grosser Knitting Machine Company, New York City 42
C. E. Hardenbrook Company, Philadelphia .. 56
Harding & Fancourt, Inc., Philadelphia 28
Hemphill Manufacturing Company, Pawtucket, R. I. 62, 63, 64
John W. Hepworth & Co., Philadelphia 29
Hess-Bright Manufacturing Co., Philadelphia 91
H. H. Hubbert, Philadelphia 67
Industrial Thrown Silk Co., New York City .. 50
Jenckes Knitting Machine Company, Pawtucket, R. I. 53
Kaumagraph Company, New York City 60
Kilbourn Manufacturing Corporation, New Brunswick, N. J. 72
W. T. Lane & Bro., Poughkeepsie, N. Y. 103
Lehigh Valley Silk Mills, Allentown, Pa. 43
Link Belt Co., Nicetown, Pa. 92
George D. Mayo Machine Company, Boston, Mass. 42
McConnel & Co., Ltd., Manchester, Eng. 51
Merrow Machine Company, Hartford, Conn. 52
Metropolitan Sewing Machine Company, Nyack, N. Y. 30
Meyercord Company, Chicago, Ill. 9
National Silk Dyeing Co., Paterson, N. J. 37
New Branson Knitting Machine Co., Philadelphia 57
New York Revolving Portable Elevator Company, Jersey City, N. J. 98
Edwin A. Newton, Philadelphia 74
Nicetown Dye Works, Philadelphia 102
W. G. Nixon & Co., Philadelphia 26
Nonotuck Silk Company, Philadelphia 15
Paxton & O'Neil, Philadelphia 84
Philadelphia Drying Machinery Co., Philadelphia 100
Philadelphia Textile Machinery Co., Philadelphia 1
T. J. Porter & Sons, Philadelphia 90
Rhode Island Processing Company, Coventry, R. I. 61
William C. Robinson & Son Company, Philadelphia 48
Roessler & Hasslacher Chemical Co., New York City 101
The Rose Machine Company, Grand Rapids, Mich. 44
Schaum & Uhlinger, Inc., Philadelphia 99
Scholler Bros. Company, Philadelphia 31
Scott & Williams, Inc., Boston, Mass. 42
Henry L. Scott & Co., Providence, R. I. 69
J. L. Shoemaker & Co., Philadelphia 27
Smith, Drum & Co., Philadelphia 77
E. O. Spindler, New York City 66
Standard Machine Co., Philadelphia 14
Alfred Suter, New York City 88
Universal Winding Company, Boston, Mass. 93
Villa Stearns Company, New York City 5
Textile Colorists, Philadelphia 94
Textile Manufacturers' Journal, New York City 81
Textile World Record, Boston, Mass. 10
Tolhurst Machine Company, Troy, N. Y. 79
Union Special Machine Company, Philadelphia 6
Thomas Wolstenholme Sons Co., Philadelphia 83
Wildman Manufacturing Company, Norristown, Pa. 54
Walter Zeigler, Riverside, N. J. 22
O. F. Zurn Company, Philadelphia, ...75. 76

THE REVISION OF SCHEDULE K

On March 21 Chairman Underwood of the House Ways and Means Committee introduced a bill identical with the one bearing his name and passed by the House of Representatives in the summer of 1911 for the revision of schedule K. On the following day, March 22, Congressman Sereno E. Payne introduced a bill which had been framed by Congressman E. J. Hill, of Connecticut, and which had been slightly changed and then approved by the Republican minority of the Ways and Means Committee. It was stated that the Hill bill had been based on the findings of the Tariff Board. Although a Payne bill, it is popularly known as the Hill bill, which serves to distinguish it from the schedule K now on the statute book. The Underwood bill passed the House on April 1 by a vote of 191 to 92. The Underwood and Hill bills are given below:

The Underwood Bill

A bill to reduce the duties on wool and manufactures of wool:—Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That on and after the first day of January, nineteen hundred and thirteen, the articles hereinafter enumerated, described, and provided for shall, when imported from any foreign country into the United States or into any of its possessions (except the Philippine Islands and the islands of Guam and Tutuila), be subjected to the duties hereinafter provided, and no others; that is to say:

1. On wool of the sheep, hair of the camel, goat, alpaca, and other like animals, and on all wools and hair on the skin of such animals, the duty shall be twenty per centum ad valorem.

2. On all noils, top waste, card waste, slubbing waste, roving waste, ring waste, yarn waste, bur waste, thread waste, garnetted waste, shoddies, mungo, flocks, wool extract, carbonized wool, carbonized noils, and on all other wastes and on rags composed wholly or in part of wool, and not specially provided for in this Act, the duty shall be twenty per centum ad valorem.

3. On combed wool or tops and roving or roping, made wholly or in part of wool or camel's hair, and on other wool and hair which have been advanced in any manner or by any process of manufacture beyond the washed or scoured con-

dition, not specially provided for in this Act, the duty shall be twenty-five per centum ad valorem.

4. On yarns made wholly or in part of wool, the duty shall be thirty per centum ad valorem.

5. On cloths, knit fabrics, felts not woven, and all manufactures of every description made, by any process, wholly or in part of wool, not specially provided for in this Act, the duty shall be forty per centum ad valorem.

6. On blankets and flannels, composed wholly or in part of wool, the duty shall be thirty per centum ad valorem: Provided, That on flannels composed wholly or in part of wool, valued at above fifty cents per pound, the duty shall be forty-five per centum ad valorem.

7. On women's and children's dress goods, coat linings, Italian cloths, bunting, and goods of similar description and character, composed wholly or in part of wool, and not specially provided for in this Act, the duty shall be forty-five per centum ad valorem.

8. On clothing, ready-made, and articles of wearing apparel of every description, including shawls whether knitted or woven, and knitted articles of every description made up or manufactured wholly or in part, and not specially provided for in this Act, composed wholly or in part of wool, the duty shall be forty-five per centum ad valorem.

9. On webbings, gorings, suspenders, braces, bandings, beltings, bindings, braids, galloons, edgings, insertings, flouncings, fringes, gimps, cords, cords and tassels, ribbons, ornaments, laces, trimmings, and articles made wholly or in part of lace, embroideries and all articles embroidered by hand or machinery, head nets, nettings, buttons or barrel buttons or buttons of other forms for tassels or ornaments, and manufactures of wool ornamented with beads or spangles of whatever material composed on any of the foregoing made of wool or of which wool is a component material, whether containing india rubber or not, the duty shall be thirty-five per centum ad valorem.

10. On Aubusson, Axminster, moquette, and chenille carpets, figured or plain, and all carpets or carpeting of like character or description, the duty shall be forty per centum ad valorem.

11. On Saxony, Wilton, and Tourney velvet carpets, figured or plain, and all carpets or carpeting of like character or description, the duty shall be thirty-five per centum ad valorem.

12. On Brussels carpets, figured or plain, and all carpets or carpeting of like character or description, the duty shall be thirty per centum ad valorem.

13. On velvet and tapestry velvet carpets, figured or plain, printed on the warp or otherwise, and all carpets or carpeting of like character or description, the duty shall be thirty-five per centum ad valorem.

14. On tapestry Brussels carpets, figured or plain, and all carpets or carpeting of like character or description, printed on the warp or otherwise, the duty shall be thirty per centum ad valorem.

15. On treble ingrain, three-ply, and all-chain Venetian carpets, the duty shall be thirty per centum ad valorem.

16. On wool Dutch and two-ply ingrain carpets, the duty shall be twenty-five per centum ad valorem.

17. On carpets of every description, woven whole for rooms, and Oriental, Berlin, Aubusson, Axminster, and similar rugs, the duty shall be fifty per centum ad valorem.

18. On druggets and bockings, printed, colored, or otherwise, the duty shall be twenty-five per centum ad valorem.

19. On carpets and carpeting of wool, flax, or cotton, or composed in part of any of them, not specially provided for in this Act, and on mats, matting, and rugs of cotton, the duty shall be twenty-five per centum ad valorem.

20. Mats, rugs for floors, screens, covers, hassocks, bed sides, art squares, and other portions of carpets or carpeting, made wholly or in part of wool, and not specially provided for in this Act, shall be subjected to the rate of duty herein imposed on carpets or carpeting of like character or description.

21. Whenever in this Act the word "wool" is used in connection with a manufactured article of which it is a component material, it shall be held to include wool or hair of the sheep, camel, goat, alpaca, or other like animals, whether manufactured by the woolen, worsted, felt, or any other process.

Sec. 2. That on and after the day when this Act shall go into effect all goods, wares, and merchandise previously imported, and hereinbefore enumerated, described, and provided for, for which no entry has been made, and all such goods, wares, and merchandise previously entered without payment of duty and under bond for warehousing, transportation, or any other purpose, for which no permit of delivery to the importer or his agent has been issued, shall be subjected to the duties imposed by this Act and no other duty, upon the entry or the withdrawal thereof.

Sec. 3. That all Acts and parts of Acts in conflict with the provision of this Act be, and the same are hereby, repealed. This Act shall take effect and be in force on and after the first day of January, nineteen hundred and thirteen.

The Hill Bill

A bill to amend an Act entitled "An Act to provide revenue, equalize duties and encourage the industries of the United States, and for other purposes," approved August fifth, nineteen hundred and nine:—Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Act entitled "An Act to provide revenue, equalize duties and encourage the industries of the United States, and for other purposes," approved August fifth, nineteen hundred and nine, be, and the same is hereby, amended by striking out all of the paragraphs of Schedule K of section one of said Act, from three hundred and sixty to three hundred and ninety-five, inclusive of both, and inserting in place thereof the following:

1. All wools, hair of the camel, goat, alpaca,

and other like animals shall be divided, for the purpose of fixing the duties to be charged thereon, into the two following classes:

2. Class one, that is to say, merino, mestiza, metz, or metis wools, or other wools of Merino blood, immediate or remote, Down clothing wools, and wools of like character with any of the preceding, including Bagdad wool, China lamb's wool, Castel Branco, Adrianople skin wool or butcher's wool, and such as have been heretofore usually imported into the United States from Buenos Aires, New Zealand, Australia, Cape of Good Hope, Russia, Great Britain, Canada, Egypt, Morocco, and elsewhere, and Leicester, Cotswold, Lincolnshire, Down combing wools, Canada long wools, or other like combing wools of English blood, and usually known by the terms herein used, and all wools not hereinafter included in class two, and also the hair of the camel, Angora goat, alpaca, and other like animals.

3. Class two, that is to say, Donskoi, native South American, Cordova, Valparaiso, native Smyrna, Russian camel's hair, and all such wools of like character as have been heretofore usually imported into the United States from Turkey, Greece, Syria, and elsewhere, excepting improved wools hereinafter provided for.

4. The standard samples of all wools, which are now or may be hereafter deposited in the principal custom-houses of the United States, under the authority of the Secretary of the Treasury, shall be the standards for the classification of wools under this Act, and the Secretary of the Treasury is authorized to renew these standards and to make such additions to them from time to time as may be required, and he shall cause to be deposited like standards in other custom houses of the United States when they may be needed.

5. Whenever wools of class two shall have been improved by the admixture of merino or English blood, from their present character, as represented by the standard samples now or hereafter to be deposited in the principal custom-houses of the United States, such improved wools shall be classified for duty as class one.

6. If any bale or package of wool or hair specified in this Act, invoiced or entered as of class two, or claimed by the importer to be dutiable as of class two, shall contain any wool or hair subject to the rate of duty of class one, the whole bale or package shall be subject to the rate of duty chargeable on wool of class one; and if any bale or package be claimed by the importer to be shoddy, mungo, flocks, wool, hair, or other material of any class specified in this Act, and such bale contain any admixture of any one or more of said materials, or of any other material, the whole bale or package shall be subject to duty at the highest rate imposed upon any article in said bale or package.

7. The duty on all wool and hair of class one, if imported in the grease, shall be laid upon the basis of its clean content. The clean content shall be determined by scouring tests which shall be made according to regulations which the Secretary of the Treasury may prescribe. The duty on all wools and hair of class one imported in the grease shall be eighteen cents per pound on the clean content, as defined above. If imported scoured, the duty shall be nineteen cents per pound.

8. The duty on all wools of class two, including camel's hair of class two, imported in their natural condition, shall be seven cents per pound. If scoured, nineteen cents per pound: Provided, That on consumption of wools of class two, including camel's hair, in the manufacture of carpets, druggets and bockings, printed, colored, or otherwise, mats, rugs for floors, screens, covers, hassocks, bedsides, art squares, and portions of carpets or carpeting hereafter manufactured or produced in the United States in whole or in part from wools of class two, including camel's hair, upon which duties have been paid, there shall be allowed to the manufacturer or producer of such articles a drawback equal in amount to the duties paid less one per centum of such duties on the amount of the wools of class two, including camel's hair of class two, contained herein; such drawback shall be paid under such rules and regulations as the Secretary of the Treasury may prescribe.

9. The duty on wools on the skin shall be two cents less per pound than is imposed upon the clean content as provided for wools of class one, and one cent less per pound than is imposed upon wools of class two imported in their natural condition, the quantity to be ascertained under such rules as the Secretary of the Treasury may prescribe.

10. Top waste and slubbing waste, eighteen cents per pound.

11. Roving waste and ring waste, fourteen cents per pound.

12. Noils, carbonized, fourteen cents per pound.

13. Noils, not carbonized, eleven cents per pound.

14. Garnetted waste, eleven cents per pound.

15. Thread waste, yarn waste, and wool wastes not specified, nine and one-half cents per pound.

16 Shoddy, mungo, and wool extract, eight cents per pound.

17. Woolen rags and flocks, two cents per pound.

18. Combed wool or tops, made wholly or in part of wool, or camel's hair, twenty cents per pound on the wool contained therein, and in addition thereto five per centum ad valorem.

19. Wool and hair which have been advanced in any manner or by any process of manufacture beyond the washed or scoured condition, but less advanced than yarn, not specially provided for in this section, twenty cents per pound on the wool contained therein, and in addition thereto eight per centum ad valorem.

20. On yarns, made wholly or in part of wool, valued at not more than thirty cents per pound, the duty shall be twenty-one and one-half cents per pound on the wool contained therein, and in addition thereto ten per centum ad valorem.

Valued at more than thirty cents and not more than fifty cents per pound, twenty-one and one-half cents per pound on the wool contained therein, and in addition thereto fifteen per centum ad valorem.

Valued at more than fifty cents and not more than eighty cents per pound, twenty-one and one-half cents per pound on the wool contained therein, and in addition thereto twenty per centum ad valorem:

Valued at more than eighty cents per pound, twenty-one and one-half cents per pound on the wool contained therein, and in addition thereto twenty-five per centum ad valorem.

21. On cloths, knit fabrics, flannels, felts, and all fabrics of every description made wholly or in part of wool, not specially provided for in this section, valued at not more than forty cents per pound, the duty shall be twenty-five cents per pound on the wool contained therein, and in addition thereto thirty per centum ad valorem.

Valued at more than forty cents and not more than sixty cents per pound, twenty-six cents per pound on the wool contained therein, and in addition thereto thirty-five per centum ad valorem.

Valued at more than sixty cents and not more than eighty cents per pound, twenty-six cents per pound on the wool contained therein, and in addition thereto forty per centum ad valorem.

Valued at more than eighty cents and not more than one dollar per pound, twenty-six cents per pound on the wool contained therein, and in addition thereto forty-five per centum ad valorem.

Valued at more than one dollar and not more than one dollar and fifty cents per pound, twenty-six cents per pound on the wool contained therein, and in addition thereto fifty per centum ad valorem.

Valued at more than one dollar and fifty cents per pound, twenty-six cents per pound on wool contained therein, and in addition thereto fifty-five per centum ad valorem.

22. On blankets and flannels for underwear composed wholly or in part of wool, valued at not more than forty cents per pound, the duty shall be twenty-three and one-half cents per pound on the wool contained therein, and in addition thereto twenty per centum ad valorem.

Valued at more than forty cents and not more than fifty cents per pound, twenty-three and one-half cents per pound on the wool contained therein, and in addition thereto twenty-five per centum ad valorem.

Valued at more than fifty cents per pound, twenty-three and one-half cents per pound on the wool contained therein, and in addition thereto thirty per centum ad valorem.

Provided, That on blankets over three yards in length the same duties shall be paid as on cloths.

23. On ready-made clothing and articles of wearing apparel, knitted or woven, of every description, made up or manufactured wholly or in part and composed wholly or in part of wool, the rate of duty shall be as follows:

If valued at not more than forty cents per pound, the duty shall be twenty-five cents per pound on the wool contained therein, and in addition thereto thirty-five per centum ad valorem.

If valued at more than forty cents and not more than sixty cents per pound, twenty-six cents per pound on the wool contained therein, and in addition thereto forty per centum ad valorem.

If valued at more than sixty cents and not more than eighty cents per pound, twenty-six cents per pound on the wool contained therein, and in addition thereto forty-five per centum ad valorem.

If valued at more than eighty cents and not more than one dollar per pound, twenty-six cents per pound on the wool contained therein, and in addition thereto fifty per centum ad valorem.

If valued at more than one dollar and not more than one dollar and fifty cents per pound, twenty-six cents per pound on the wool contained therein, and in addition thereto fifty-five per centum ad valorem.

If valued at more than one dollar and fifty cents per pound, twenty-six cents per pound on the wool contained therein, and in addition thereto sixty per centum ad valorem.

24. On all manufactures of every description made wholly or in part of wool, not specially provided for in this section, the duty shall be twenty-six cents per pound on the wool contained therein, and in addition thereto fifty per centum ad valorem: Provided, That if the component material of chief value in such manufactures is wood, paper, rubber, or any of the baser metals, the duty shall be twenty-six cents per pound on the wool contained therein, and in addition thereto thirty-five per centum ad valorem, and if the component material of chief value in such manufactures is silk, fur, precious or semi-precious stones, or gold, silver, or platinum, the duty shall be twenty-six cents per pound on the wool contained therein, and in addition thereto fifty-five per centum ad valorem.

25. On hand-made Aubusson, Axminster, Oriental, and similar carpets and rugs, made wholly or in part of wool, the rate of duty shall be fifty per centum ad valorem; on all other carpets of every description, druggets and bockings, printed, colored, or otherwise, mats, rugs for floors, screens, covers, hassocks, bedsides, art squares, and portions of carpets or carpeting, made wholly or in part of wool, the duty shall be thirty per centum ad valorem.

26. Whenever, in any schedule of this Act, the word "wool" is used in connection with a manufactured article of which it is a component material, it shall be held to include wool or hair of the sheep, camel, goat, alpaca or other animal, whether manufactured by the woolen, worsted, felt, or any other process.

27. The foregoing paragraphs, providing the rates of duty herein for manufactures of wool, shall take effect on the first day of January, nineteen hundred and thirteen.

The shipments of cotton piece-goods from the United States for the seven months ended July show that the yardage was 218,947,000, as compared with 164,979,500 yards in the same period of 1910. For July the figures are 29,816,642 yards, as compared with 26,702,910 yards in 1910. The only market of any importance to the United States is China, and the exports for the seven months amount to 61,831,000 yards, against 46,431,000 yards last year.

WILLOW FIBER

BY LOCK HAVEN

Commercial willow bark is obtained as a by-product in the cultivation of willows used for basket making. The inner bark or bast portion of all young willow shoots suitable for weaving baskets, furniture, etc., contain sufficient fiber to make them valuable in the textile industry. In Europe, particularly in Germany, France, and parts of Russia, a good grade of fiber is obtained from this source. The use of willow bast in the manufacture of textile fabric is new and at the present time all processes through which the bark has to pass are patented. Those who are now using the bark for this purpose, are unable to give any definite information in regard to the preparation of the raw material without infringing on the secret processes of the inventors. It is known, however, that the bark either in its dry or green state, is steeped in a strong lye solution which separates the outer parenchymatous or thin corky portion from the inner fibrous layer. The bast separates into fine threads or fibers which, when properly washed and dried, are readily spun into moderately strong twine and woven into a coarse fabric from which gunny sacks are made.

In Germany and France the use of this product is increasing steadily, but up to the present time willow bark has had no market value in the United States. There is little doubt, however, that it will be used for fiber as soon as its value becomes generally known. As soon as the bark can be obtained in sufficiently large quantities by textile concerns, willow growers will have no difficulty in realizing an additional revenue from the sale of this product. It is estimated that during the past year at least a thousand tons of willow bark have been wasted in this country, material which might have been put to economic use.

BASKETS, WILLOW RODS AND A PILE OF WILLOW BARK

About a half a ton of dry bark may be obtained from an acre of basket willows, and a ton of dry bark of the best variety sells for as high as $30 per ton. The almond willow (Salix amygdalina L.) yields the greatest amount of fiber per acre while the purple willow (Salix purpurea L.) produces considerably less fiber, but of a much better quality. In France the bark of all varieties of basket willows are used also for fodder and bedding for cattle and sheep, and for these purposes it has a market value of $15 per ton. It is used also in the manufacture of door mats which outlast those made from straw and rush.

Correspondence and Notes

UPON TEXTILE TOPICS AT HOME AND ABROAD

PREVENTING DAMAGE TO THE CIRCLES OF NOBLE COMBS

BY JOHN BROWN

The Noble comb, owing to its adaptability for dealing with almost all classes of wool, its compactness and the small amount of power required to drive it, is now the most popular machine in the wool combing trade. Among its weak points is the large cost of the brushes and drawing leathers. Owing to

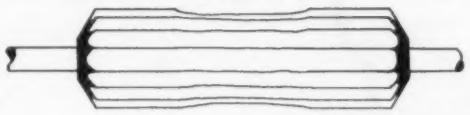


FIG. 1.

using perpendicular rollers there is the liability of circles being damaged if an end breaks down, causing the fibers wrapping around the roller. In the nep and square motion combs on which the drawing-off rollers are horizontal, there is far less danger of the circles being damaged by a lap, because the part of the roller which draws off the biggest bulk of the sliver is farthest from the circle. A fair size lap can form on the boiler without doing serious damage to the circle. On the Noble comb, however, the roller and pins of the circle are set parallel and the bare roller, where most of the lap forms is set so close to the circle that if the end breaks and a lap forms, it at once comes into contact with the pins, with the result that if the machine is not at once stopped the circle is seriously damaged. As a result a very small lap soon fills the space between roller and pins, the lap dragging in one direction and the circle traveling in the other. The pins are soon pulled out of line and if not detected immediately they are broken off at the base. When this happens the machine must be stopped until the damaged circle is replaced, or, if the damage is only slight, until the pins are straightened by the comb setter. In either case a loss of time is the result.

Several devices have been tried to prevent combs from being damaged when the ends break. As laps on the rollers are the most frequent cause of damage to circles, it is well to examine the general causes of ends breaking down. First, uneven slivers from the gill box, leaving thin places, or light and heavy slivers used side by side in the punch box. Second, careless feeding, that is, allowing the sliver to run out, where piecing occurs in the punch ball, without immediately replacing it. Third, working wool too dry.

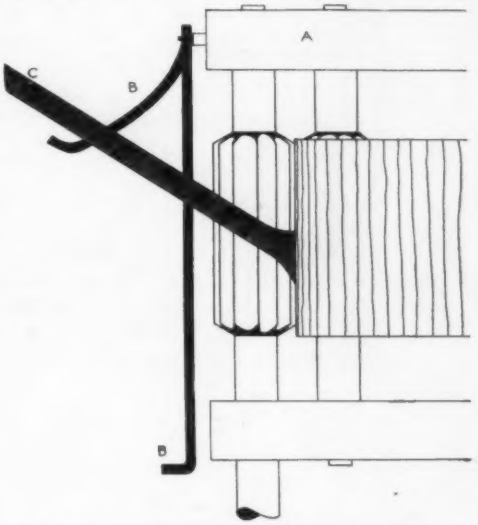


FIG. 2. A. HEADSTOCK. B. TRIGGER HELD IN POSITION BY SLIVER C.

The dry wool is soon charged with electricity, especially in dry combing, resulting in the fibers splaying and sticking to any metal they come in contact with. Third, running the rollers until they are worn hollow where the drawing-off is done, Fig. 1. Fourth, uneven pressure on the roller springs. If the wool has a tendency to rise in the pins as it is being drawn off, a few turns on the screw, slightly increasing the pressure on the top part of the roller will obviate this. Fifth, uneven leathers, that is, thicker at the joints than other parts, or run-

ning the leathers until they become badly worn, or the joints work loose.

As a comb mender generally follows more than one machine, and an end may break down at one machine while they are attending the other, it is an advantage for the machine to be automatically stopped as soon as the end breaks, thus preventing any damage to the circle. The best contrivances are the falling lever and the hinged rubber.

The first, shown at Fig. 2, has a loose lever which works on a stud fixed either on the roller head or on a suitable stand. It is balanced so that if either the sliver from the outside or inside roller breaks down, the lever drops and comes in contact either with a sliding bar similar to that on the ordinary

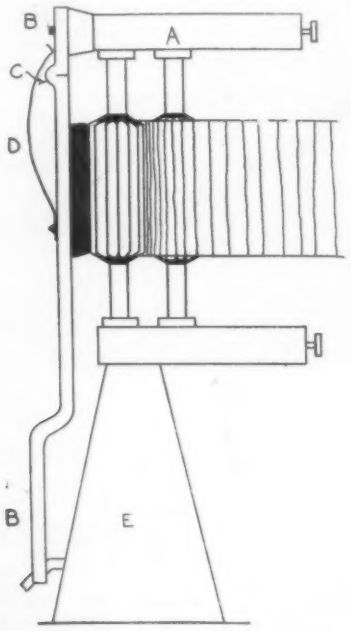


FIG. 3.

slubbing box, or with a mechanical contrivance, in connection with the stripping bar of the machine. The weak part of this device is that a moderate lap may form on the outside roller before it comes into play, as in almost all cases both slivers are run into one and the lever can be fitted only to the inside rollers.

The hinged rubber, shown at Fig. 3, can be fixed to both the inside and outside rollers and is so simple that it requires little explanation. It is simply an ordinary rubber with the lower end free. It is fastened to

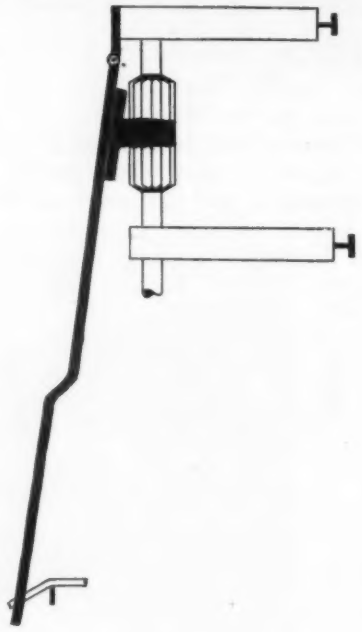


FIG. 4.

the headstock with a set screw, A. The lower part is hinged at B. The lower part of the rubber, C, is extended to within an

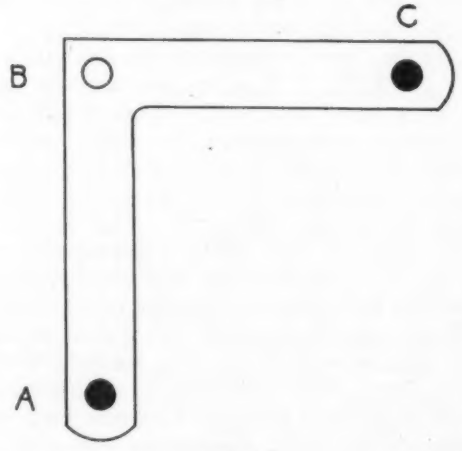


FIG. 5.

inch of the bed plate. It will be readily seen that owing to the length of the lower part,

a very small lap pushes the end of the iron a long way out of plumb, Fig. 4. The bottom end of the rubber bar can be attached either to an L shaped casting, Fig. 5, or by a flexible wire to the spring lever on the stripping rod, Fig. 6.

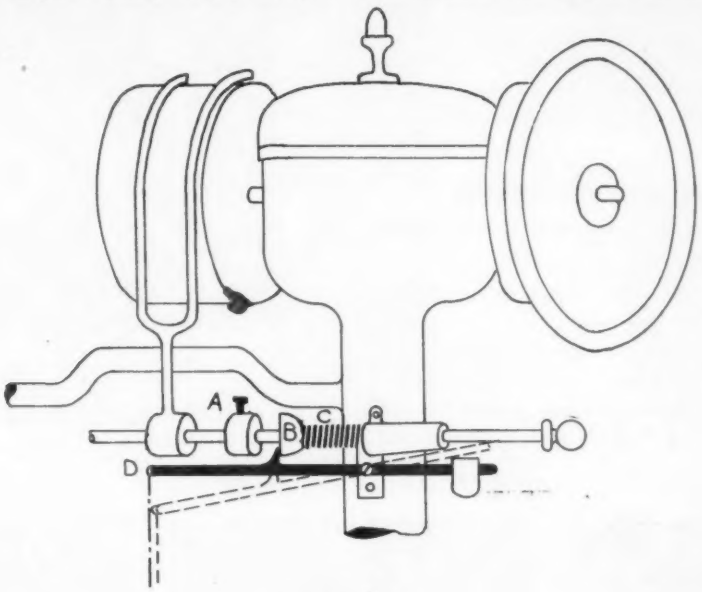


FIG. 6.

Fig. 6 shows the lever and spring as it appears when the comb is running all right. The dotted lines show the lever drawn down when the end breaks, as in Fig. 2, or when a lap forms, as in Fig. 3. When either of these two things happen the flexible wire, attached to the end of the drop lever or to bottom of the hinged rubber, draws the lever, D, down and thus releases the spring, forcing the stripping rod away and thus stopping the comb.

Another method of preventing laps, much in vogue with long wool combers, is to run five leathers instead of four, and so arranged that none of the rollers are bare, Fig. 7. The leather from the pressing roller, D, instead of running around a whorl, is brought outside the roller, C. The fifth leather, E, passes around both the inside rollers. In this way each roller is covered. In the event of an end breaking it either forms a soft lap around the leather or falls to the plate where it cannot do much harm. If two funnels are used a sliver can be drawn direct from each inside roller, or one sliver can be drawn direct from each inside roller, or one sliver can be passed along the front of the leather, E, and all drawn into one sliver. If

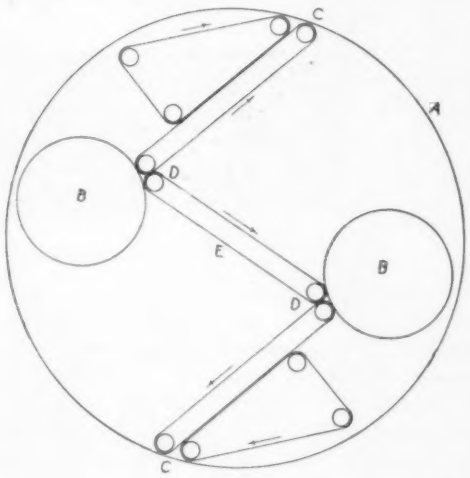


FIG. 7.

this system is adopted the leather should be rather thinner than those ordinarily used.

Before new circles are put on they should

be carefully tested with a square to make sure that the point of the flat pins slightly overhang the swell in the circle brass. This allows the circles to be set point to point if required without any fear of the rims touching each other. If the rims are allowed to touch, the swell part gets worn away and the comb is considerably weakened, making it liable to burst when the combs are undergoing repairs.

A HAND BOOK OF WEAVES

By G. H. OELSNER, Director of the Weaving School at Werdau.

Translated and Revised by Samuel S. Dale

This Series began in July, 1911

FANCY TWILLS

An endless variety of attractive twill effects can be obtained by combining basket, rib and other weaves to form a twill line, or by arranging a twill to form braided effects.

FIG. 540. FIG. 541. FIG. 542. FIG. 543.

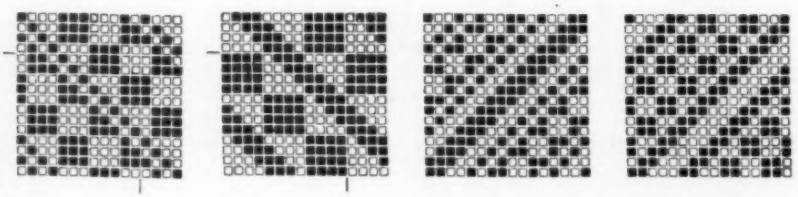
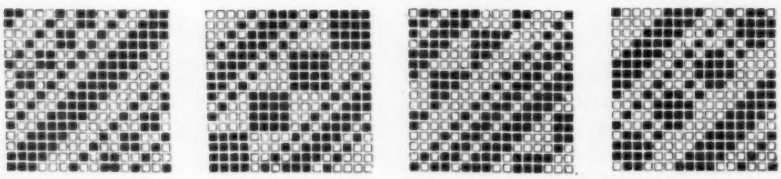


FIG. 544. FIG. 545. FIG. 546. FIG. 547.



Such patterns, however, require a large number of shafts, and frequently can be made only with a jacquard attachment. The weaves are drafted by first inserting the twill which is to form the main feature of the pattern and then filling the remaining space with the basket, rib or other weaves as desired. Examples are shown at Figs. 540 to 623.

The following are twills combined with basket weaves:

Fig. 540, 12 warp, 12 filling.
Fig. 541, 12 warp, 12 filling.
Fig. 542, 16 warp, 16 filling.

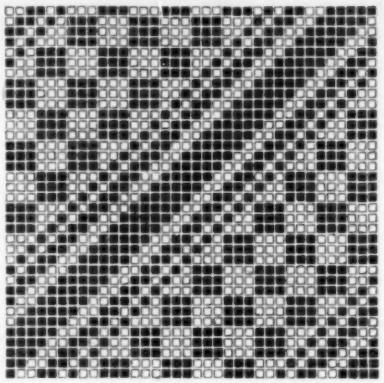


FIG. 558

Fig. 543, 16 warp, 16 filling.
Fig. 544, 16 warp, 16 filling.
Fig. 545, 16 warp, 16 filling.
Fig. 546, 16 warp, 16 filling.
Fig. 547, 16 warp, 16 filling.
Fig. 548, 16 warp, 16 filling.
Fig. 549, 16 warp, 16 filling.
Fig. 550, 18 warp, 18 filling.
Fig. 551, 16 warp, 48 filling.
Fig. 552, 11 warp, 22 filling.
Fig. 553, 20 warp, 20 filling.
Fig. 554, 24 warp, 24 filling.
Fig. 555, 24 warp, 24 filling.

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FIG. 548.

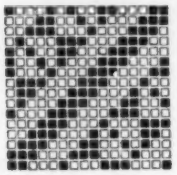
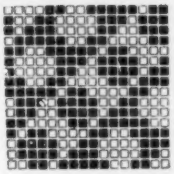


FIG. 549.



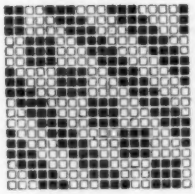


FIG. 550.

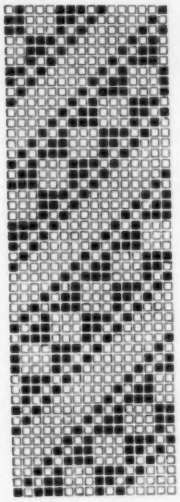


FIG. 551.

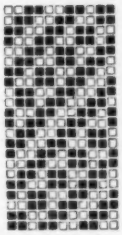


FIG. 552.

FIG. 553.

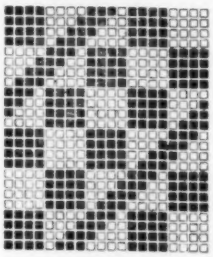
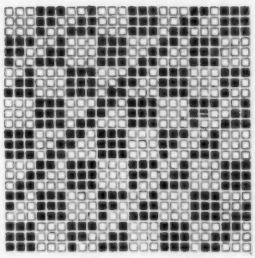


FIG. 554.



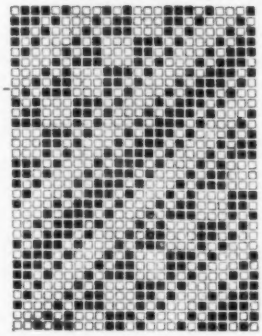


FIG. 555.

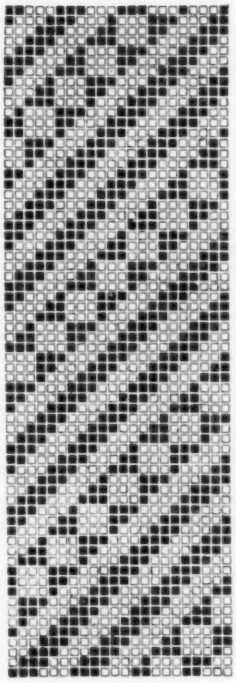


FIG 556

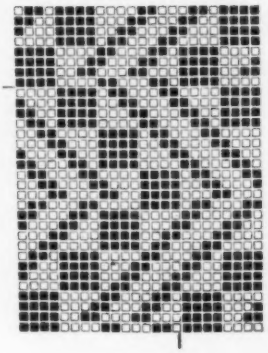


FIG. 557

Fig. 556, 22 warp, 66 filling.
Fig. 557, 16 warp, 24 filling.
Fig. 558, 36 warp, 36 filling.

The following are twills combined with rib weaves:

FIG. 559.

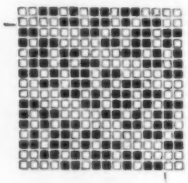


FIG. 560.

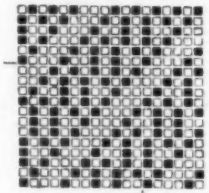
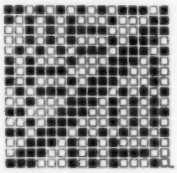
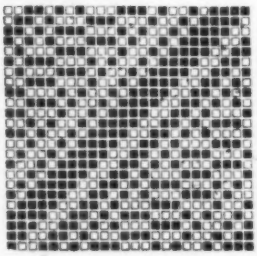
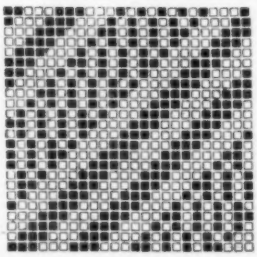


FIG. 561.







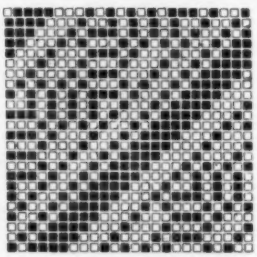


FIG. 562. FIG. 563. FIG. 564.

Fig. 559, 14 warp, 14 filling.
Fig. 560, 12 warp, 12 filling.
Fig. 561, 16 warp, 16 filling.

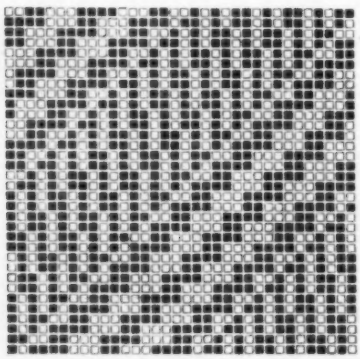


FIG. 565.

Fig. 562, 24 warp, 24 filling.
Fig. 563, 24 warp, 24 filling.
Fig. 564, 24 warp, 24 filling.
Fig. 565, 34 warp, 34 filling.
Fig. 566, 18 warp, 36 filling.

Fig. 567, 70 warp, 70 filling.

The following are twills combined with crepe weaves:

Fig. 568, 16 warp, 16 filling.
Fig. 569, 16 warp, 16 filling.
Fig. 570, 12 warp, 12 filling.
Fig. 571, 16 warp, 16 filling.
Fig. 572, 24 warp, 48 filling.

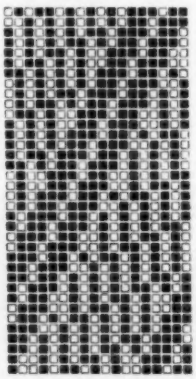


FIG. 566.

Fig. 573, 24 warp, 48 filling.
Fig. 574, 32 warp, 32 filling.
Fig. 575, 32 warp, 32 filling.

The following are effects produced by twills running in opposite directions:

FIG. 567.

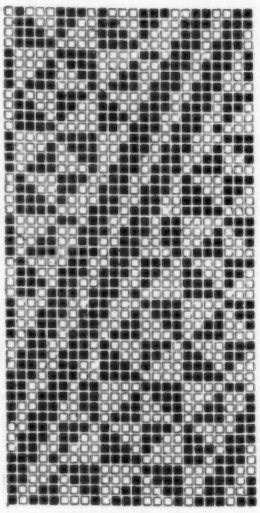


FIG. 572.

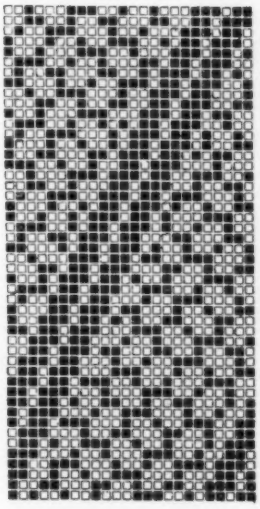


FIG. 573.

Fig. 576, 12 warp, 12 filling.
Fig. 577, 18 warp, 18 filling.

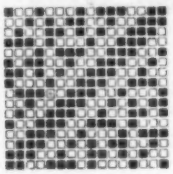


FIG. 568.

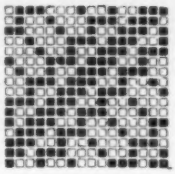


FIG. 569.

Fig. 578, 16 warp, 16 filling.
Fig. 579, 12 warp, 12 filling.

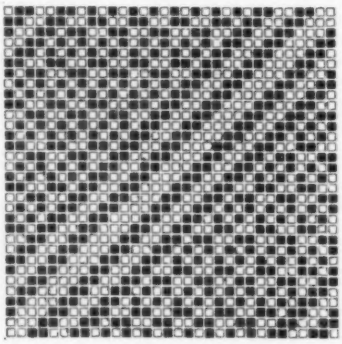


FIG. 574.

Fig. 580, 16 warp, 16 filling.
Fig. 581, 18 warp, 18 filling.

FIG. 576.

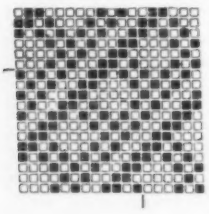


FIG. 579.

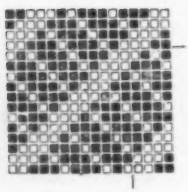


Fig. 582, 24 warp, 24 filling.
Fig. 583, 24 warp, 24 filling.

Fig. 584, 30 warp, 30 filling.
Fig. 585, 12 warp, 36 filling.

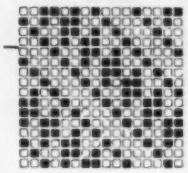


FIG. 570.

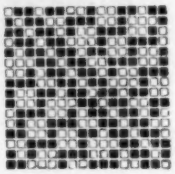


FIG. 571.

The following weaves show twills arranged to produce basket or braided effects:

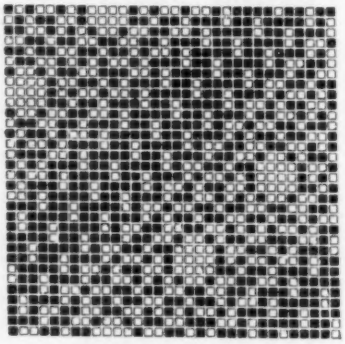


FIG. 575.

Fig. 586, 8 warp, 8 filling.
Fig. 587, 8 warp, 8 filling.

FIG. 577.

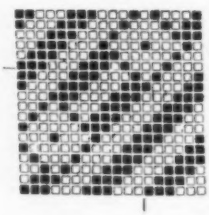


FIG. 580.

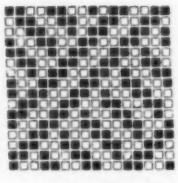


Fig. 588, 8 warp, 8 filling.
Fig. 589, 10 warp, 10 filling.

FIG. 578.

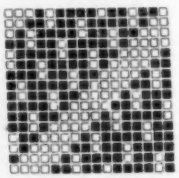


FIG. 581.

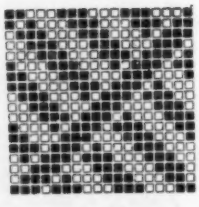


FIG. 582.

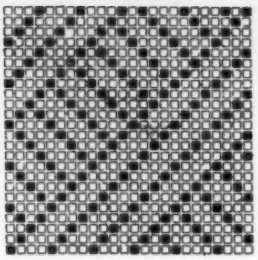
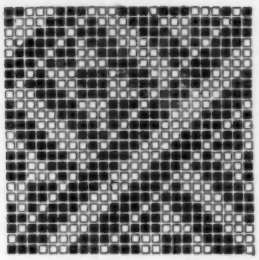


FIG. 583.



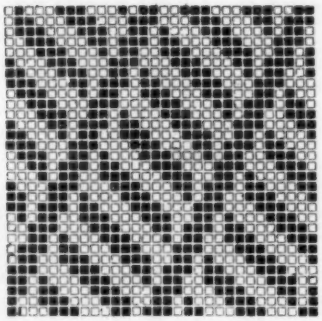


FIG. 584.
FIG. 592.

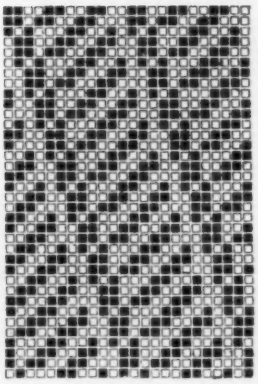
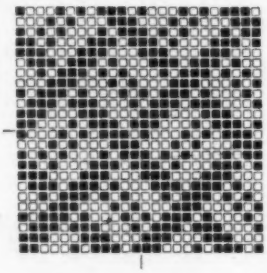
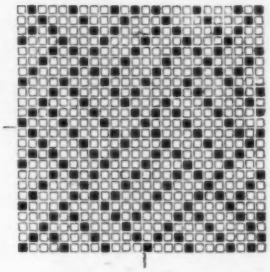


FIG. 585.
FIG. 593.





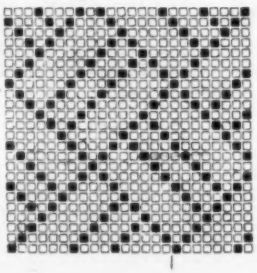


FIG. 594.

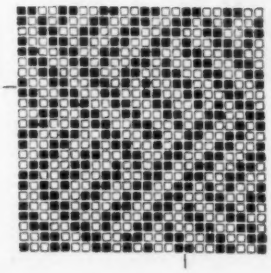


FIG. 595.

FIG. 586.

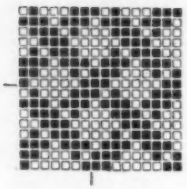


FIG. 587.

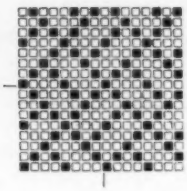
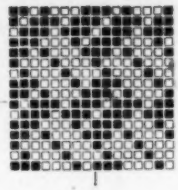


FIG. 588.



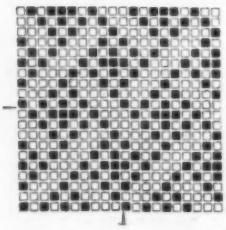


FIG. 589.

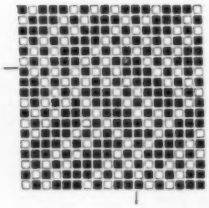


FIG. 590.

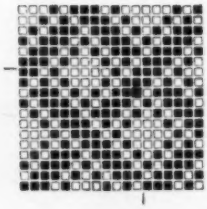


FIG. 591.

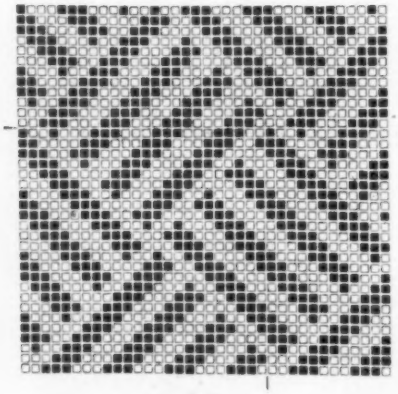


FIG. 596.

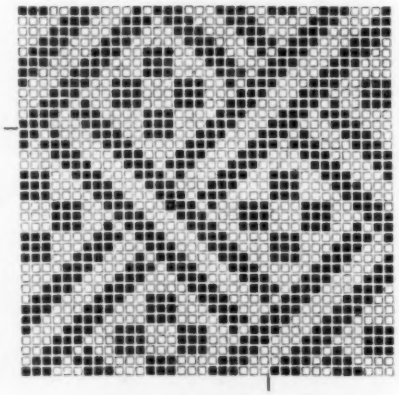


FIG. 597.

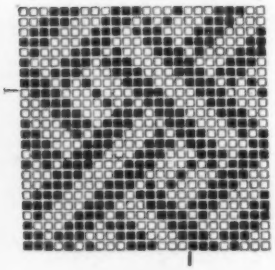


FIG. 598.

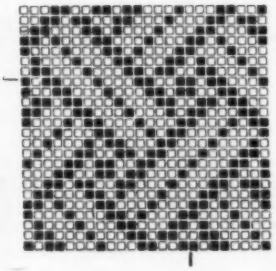


FIG. 599

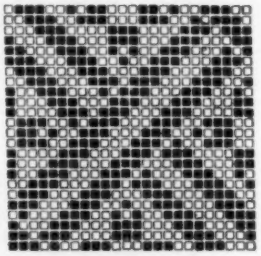


FIG. 600.

Fig. 590, 12 warp, 12 filling.
Fig. 591, 12 warp, 12 filling.
Fig. 592, 12 warp, 12 filling.
Fig. 593, 12 warp, 12 filling.
Fig. 594, 16 warp, 16 filling.
Fig. 595, 16 warp, 16 filling.

Fig. 596, 24 warp, 16 filling.
Fig. 597, 24 warp, 24 filling.
Fig. 598, 16 warp, 16 filling.
Fig. 599, 16 warp, 16 filling.
Fig. 600, 24 warp, 24 filling.
Fig. 601, 48 warp, 48 filling.

(To be continued.)

CORE YARN

BY JAMES STRAND

There is no novelty in the idea of making wool yarn with a cotton core. As far back as 1878 two Leeds men patented provisionally a process for "embedding by rolling or the rings of the ring doffers, in place of running the thread and sliver side by side. There have been plenty of other attempts made in Yorkshire and yarns produced in this manner have been seen and tried often. Twenty years ago a great many woolen men were puzzling over the problem of how to do away with the necessity for a separate twisting of the cotton and the wool, but the twisting method is practically universal today. Cotton is very extensively used as a supporting thread in the cheap carded woolens made in the Colne Valley. It is not used as a core, but as a tie thread. The wool sliver

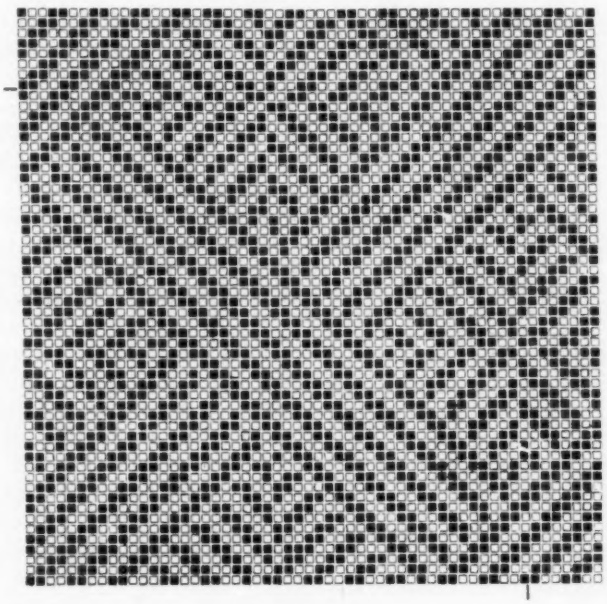


FIG. 601.

otherwise an additional twisted thread in an unspun condenser sliver, the combined thread being wound upon a bobbin without any twist and used as a weft in weaving soft and strong fabrics." In 1901 two Halifax (Eng.) men took out a patent for a yarn consisting of "a sliver from a condenser rubbed round a core of cotton, the combined thread being wound on a condenser bobbin and spun in the ordinary way." There have also been patented schemes for covering a core of twisted paper with wool in a similar manner and for making cotton core yarn by drawing the cotton thread diagonally across is spun on the mule cop and the two are brought together upon the ring twisting frame.

Following are the experiences of two eminently practical men in making core yarn:

Says A: "The two ways I remember were:

"1st. Cotton spools placed under the condenser, the ends being led through the divider with the soft sliver. Thread and sliver were rubbed together and run on the bobbins in the usual way.

"2d. The condenser bobbins were taken direct to the twisting frame and the soft sliver was twisted with the cotton thread.

"Both methods were failures because a woolen thread is no good unless it is drawn during spinning."

Says B: "The drawback to running the cotton and woolen threads together on the mule is that you cannot draw the woolen when the cotton passes through the rollers at the same time. You do not get as nice or as strong a yarn as one that is drawn a little in the spinning. Another fault is that there is too much space on the mule between the rollers and the spindle top, consequently the yarn has a tendency to show soft places owing to the greater thickness and heaviness of the woolen."

The theoretical purpose of using the cotton as a core instead of a companion thread is to make the former less conspicuous in the finished cloth. I send a sample or two of Colne Valley tweed to correct any impression that a two-fold cotton and woolen thread necessarily proclaims its character upon the surface. It will be agreed by anyone that whether judged by touch or sight the cotton support is well hidden in the softer cloth.

"Twisting is an extra," to continue my quotation from A, "but that is done very cheaply and the thread is good in every way. You can mill the cloth to get a good cover, raise it if necessary and use it pretty roughly and still have a sound piece of goods. Or you can alter your blend and ideas. You can make the cotton thread light in color and get fine worsted-twist-looking patterns in another finish."

Seeking further experiences of the production of cotton core yarn I turned to the patentee of a process for wrapping an untwisted worsted sliver spirally round a central thread of cotton. The work was done on an ordinary flyer drawing and twisting frame, permitting the sliver to be reduced to the desired thinness. The cotton was led through the nip of the front drawing rollers to one side of the untwisted sliver and was then drawn diagonally across the front of the rollers, close to the nip and thence down to the spindles. The path of the cotton was kept close to the nip to avoid twisting the worsted, the intention behind the whole operation being the production of a yarn which should not shring unequally and raise knots and lumps in the fabric under the hands of the cloth finisher. The patent has been allowed to lapse, but as Mr. Brogden's experience may be useful I explain that the object of the experiment was the production of khaki cotton-faced drills with a wool back. The worsted sliver used was fine merino and the cotton core a good Egyptian. The warp of the cloth was Egyptian cotton also and without great difficulty a smart cotton-faced khaki drill fulfilling Government tests was produced. The maker was conscious of certain defects in the fabric and the Government experts found these out. The avoidance of twist in the sliver did not entirely prevent inequality of shrinkage. Worse still, the wool back did not wear well. Where creases were formed in wear the sliver was soon rubbed off the filling, leaving thin streaks in the garment. It is not improbable that carded woolen sliver which has only been rubbed on a cotton core will also soon be rubbed off and the contingency deserves to be reckoned with and observed.

Pushing inquiry further afield, I sought the advice of a silk man who in his own time has been a bold experimenter. He had heard of a process, applied to silk and not necessarily inapplicable to wool, in which a silk roving was twisted round a cotton thread upon a twisting frame. Two rollers were used, one delivering silk, one cotton, the silk coming the faster. The two were passed to a spindle having a double flyer and set at such an angle that only the roving came in contact with the cotton at the point at which the bobbin was practically reached. He had examined also a collection of samples in which thrown silk had been twisted round a cotton core to make a sort of "rolled-gold" silk poplin and in which also thrown silk was twisted around flexible wire to make onde and spiral effects. It is clear that the production of core yarn has attracted notice in widely different directions. To name one other, one might refer casually to the different means taken for producing ropes with cores of steel or strong fibrous materials.

ENGLISH NOTES

By Our Regular Correspondent

Some attempts have been made to sum up the total importance of the wool industries of the world with results not supremely satisfying. It is uncertain whether there are 500 million sheep, as calculated by the Australian Minister of Agriculture, 600 millions as computed by the U. S. Bureau of Agriculture or 700 millions as conjectured by W. J. Battison. It is uncertain how many men or shepherds live sheep employ, for in one set of circumstances one man attends a thousand head and in other circumstances a mere hundred. The data warrant an estimate of half a million men at least. Wool manufacturing processes employ in this country 261,000 persons and 163,000 or more in the United States and in Germany, France, Russia, Italy, Austria and Belgium some 765,000 persons more. The mill force can scarcely be less than 1 1/4 millions and may be 1 1/2 millions.

The probable value of the raw wool and of the manufactured product is conditional upon the basis of value adopted—that of English or European values or American. The weight of raw wool raised in a year is near 3,000 million pounds in both the Australian estimate and Mr. Battison's. Its average value, judged by the sample one-quarter that is raised or imported into Great Britain, is about 18 cents, when valued over a decennial period. Accepting that standard the value of the world's wool might be called $540,000,000. The valuation of the finished product presents added difficulties, but there are two modes of reasoning which suggest substantially the same sum as a probable total. If the English consumption or manufacture of wool is approximately one-fourth of the whole supply, four times the British production might loosely indicate the aggregate value. It is known that the $350 millions recorded by the British census of production (1907) was below the truth for the year to which it applied, but ignoring the admitted error an amount of $1,400,000,000 results. Taking again the census figures it would appear that the gross production per capita of British woolen and worsted workers was roughly $1,350 per head. Assuming that the world's total of millworkers is 1 1/4 millions and leaving errors on the one hand to compensate errors on the other, an aggregate (British) value of $16,875,000,000 would appear. There are several reasons why the estimates cannot be taken too literally. Much of the wool treated in England is exported in a semi-manufactured state and the precise value of the English product is not known; again the efficiency of workpeople and machines differs from country to country. The outcome is thus no better than a suggestion that $1,500 millions at the British scale of values and perhaps $3,000 millions at the American scale does not overestimate the probable value of the world's production at the mills. At the clothing or drapery store the total is of course increased vastly.

* * *

Some light is thrown on the progress of artificial silk in this country by the publication of S. Courtauld & Co.'s accounts. The company turns out some 40,000 to 50,000 pounds of viscose yarn weekly and weaves a portion itself. Courtauld's were best known as crape manufacturers until a few years ago and in 1907 they only paid their stockholders 3 per cent. In 1909 the dividend was 10 per cent., in 1910, 20 per cent., and in 1911, 30 per cent. and the profit in the last year was $1,190,000. This make of silk is the only one that the chief piece-dyers in the trade consent to treat at their own risk.

Natural silk and artificial silk are used largely by the same parties, but the Silk Association does not consent to proceedings calculated to detract from the good name of the animal fiber. A draper was caught selling "silk" braid in which the bright material was artificial and the Government was prevailed on to prosecute. It was argued on behalf of the draper that the manufacturer, not the retailer, was to blame, and contended that, except for certain military braiding, there was no such thing as silk braid upon the London market. The draper was fined upon each of two summonses. Another draper who had invented the new name

"Colonial silk" and had applied it to the artificial silk in a silk coat he was selling was fined $100, again at the instance of the Silk Association and the Board of Trade. A plea that the "silk" was made from wood-pulp made in the colonies was unavailing.

* * *

In Oldham where something more than two hundred firms run approximately eighteen million cotton spindles a proposal intended to prevent involuntary time-cribbing is having attention. It gives a certain amount of trouble to keep the mill clock in exact harmony with the public clock that is relied on to regulate the mill time and failure to do this means a fine if detected in running beyond the hours. The proposal is to do what is done in some mill towns in Germany—set up a central clock in the offices of the Master Spinners' Association and let all the mill clocks be synchronized with it by electric wire. Uniformity might be attained by electric signal simply, but the synchronized clock gives a double safeguard as it is warranted not to err by more than five seconds in a week even though the current should fail.

* * *

The death from anthrax of a card-grinder in works where the wools scheduled dangerous are combed is the immediate cause of a new instruction to factory inspectors. Carders of such wools as Persian, East Indian, camel hair and so on are to be required to use such suction appliances in grinding their cards as are used in the cotton card rooms to remove dust. It has been ascertained by the Anthrax Investigation Board that in 57 out of 71 cases of infection by this disease circumstances pointed to short material, such as is carded before being combed, as the source of the mischief. Of the fourteen cases attributable to the long or "preparing" wools ten occurred amongst sorters, three amongst packers of noils and tops, one amongst spinners. There are general inferences that the greater speed and more thorough opening given by the carding process tend to diffuse the spores of anthrax more than the preparing process, in which hairs coagulated together by blood tend to find their way rather into noils than tops. Blood in a dried form is seen more and more to be the main carrier and the Board is almost able to say "no blood, no anthrax." The principal users of suspected wools pay their sorters a price per pound for all blood-stained wool picker from bulk and experience suggests that there is little risk in handling this death-laden stuff as long as the clots are not opened or softened.

Outbreaks of anthrax among animals have expensive effects in a country like this where pedigree sheep and other stock are bred for export. Foreign ports are closed against English animals and prices of stud stock fall heavily. This it is which lends significance to a cry that farmers are making. They say that veterinary opinion attributes outbreaks of anthrax among English animals chiefly to the importation of foreign wools and hides. They press, therefore, for the thorough disinfection of these imports.

* * *

The Textile Institute has set forth to attach a fixed meaning to the loosely-used term "indigo-dyed" and committees are at work on making a standard definition. In Manchester the matter is being considered from the cotton point of view, in Belfast the linen view is being formulated and in Bradford the woolen and worsted opinion. Those Government departments which buy blue cloth extensively have nominated representatives to attend on their behalf. The Government, being among the greatest of sinners in driving down prices to a point at which indigo cannot be used in any quantity except at a loss, owes the subject some attention. In general a cloth is "indigo" if it contains any indigo at all and some of it derives the title simply by being run through spent vats. Cloth for the navy is supposed to be dyed with vegetable indigo, not with synthetic indigotin and thus dyers are put to the expense of mixing a little leaf indigo with a great deal of tar indigo. If it were possible to attach a fixed meaning to the term no doubt prosecutions under the Merchandise Marks Act would follow against infringers.

A Lancashire loom builder has taken up the Steinen automatic loom, invented by a Swiss engineer, of which four thousand are said to be in successful work in Europe. A supply of 150 bobbins of filling is placed in the hopper and these slide to the shuttle into which they are mechanically placed. The ends of the thread are drawn into the tube of the bobbins as a preliminary operation and compressed air effects the threading of the shuttle. Electric current is also used for working the warp stop and weft feeler motions and lighting a lamp to give the weaver the signal that something is wrong. The weaving is on the under-pick principle. In Basle one man and his wife are reported to work 48 of these looms and the possibility of getting one weaver to attend to thirty or forty of them is being discussed in Lancashire. It will be seen that the apparent economy of labor is not bought without a rather formidable addition to the elaborateness of the plant.

* * *

Bad debts and bad failures form a distressing part of the long credit business done by makers of fine worsteds and tweeds. When the customer fails he owes for six months' or twelve months' supplies and when one fails there are very often one or two others to follow. However, serious bad debts are not an indispensable concomitant to business and small worsted weaving mills can be and are run almost on cash terms and large mills on payment at four to six weeks. A large maker of medium woolens, Sir Mark Oldroyd of Dewsbury has given publicly the experience of his own firm. Upon the last $10,000,000 of turnover the bad debts of his concern have been less than $5,000. The matter was mentioned with a pride which suggests that a loss below .0005 per cent. is unusual even amongst manufacturers who are able to pick and choose. The ordinary man is driven to take a little financial risk when in desperate want of work, but the instructions of the kings of the trade to their salesmen are inflexible. To be a customer of Yorkshire spinners and of manufacturers who could be named is to wear a certificate of a credit beyond suspicion and of a habit of resting content with good deliveries.

* * *

A confident ring distinguishes the remarks of Milton S. Sharp, chairman of the Bradford Dyers' Association, on the subject of the new works at Bradford, R. I. The location was called superb, and the prospects good and June or July was named as the date for beginning operation. It was not directly in this connection that he declared the Association to be "prepared in every direction to meet every form of fair competition," but Rhode Island can hardly be excluded from the survey. At home, the B. D. A. continues to exhibit its preference for the better-paid work in the market and as it sheds the less remunerative classes of business its outside competitors scramble to pick them up. Mr. Sharp, like many of our prominent dyers, comes of a dyeing family and has the reputation of being the first dyer, in Yorkshire at least, to organize a public dyeing and finishing works exclusively for one class of trade. Wilfred Ward, manager of the American, is equally a dyer by birth and by trade and at the Washer-lane and Greetland branches of the Association has been accustomed to an economical system of working.

THE EFFECT OF MOISTURE ON THE STRENGTH AND ELONGATION OF YARNS AND FABRICS

By Prof. Aldred F. Barker, F. W. Barwick and F. Pickles

(Continued from March.)

Figs. 9 and 10 represent the average strength and elongation of the Botany cloth warp and weft in both grey and dyed conditions, the average of the cotton cloth warp and weft in the grey, bleached, and dyed black, and the average of the Alaska cloth warp and weft in the grey, bleached, wool-dyed, and cross-dyed conditions.

In conjunction with the foregoing researches dealing with fabrics, a series of similar researches have been carried out on Botany, cotton and spun silk yarns. The same methods have been followed for the purposes of obtaining the "absolute dryness" of the yarns, and for obtaining the necessary

additions of moisture. The yarns were tested on the single thread principle of yarn testing, and one machine was used throughout. Comparative tests were made on two other machines under exactly similar conditions with the following results—100 being taken as representing the strength recorded by the first or standard machine:

FIG. 7. AVERAGE STRENGTH OF GREY AND FINISHED CLOTHS, WARP +WEFT

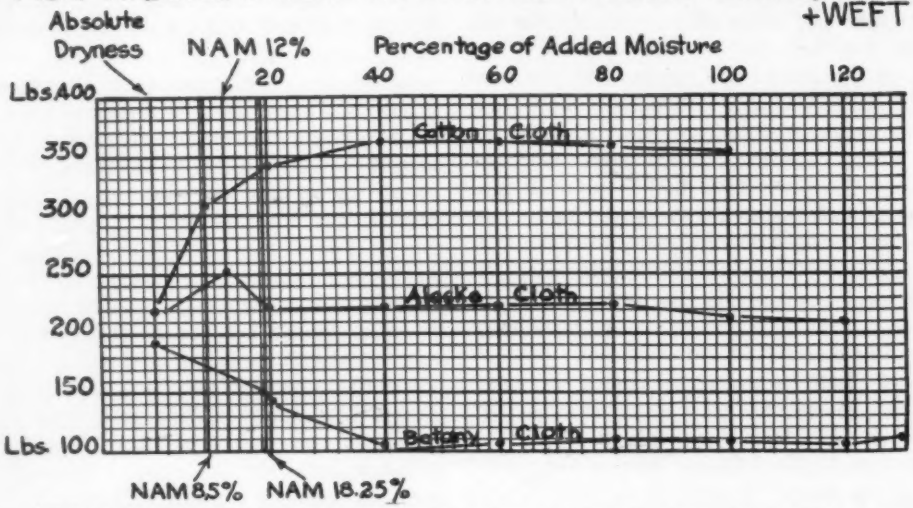
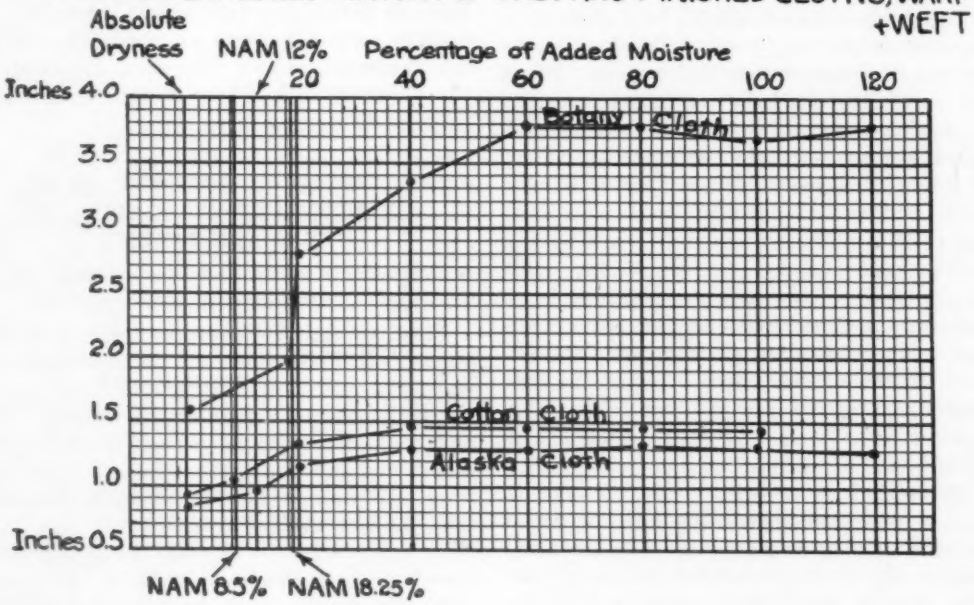


FIG. 8. AVERAGE ELONGATION OF GREY AND FINISHED CLOTHS, WARP +WEFT



No. 1 machine 100
No. 2 machine 102
No. 3 machine 99.5

It will be noticed from these results that

FIG.9. PERCENTAGE STRENGTH OF GREY AND FINISHED CLOTHS, WARP+WEFT

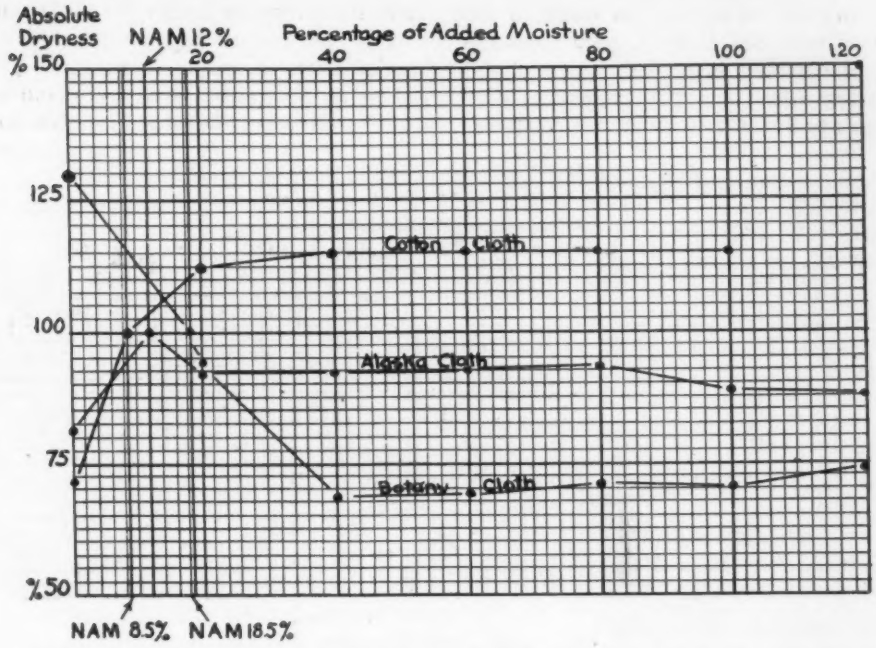
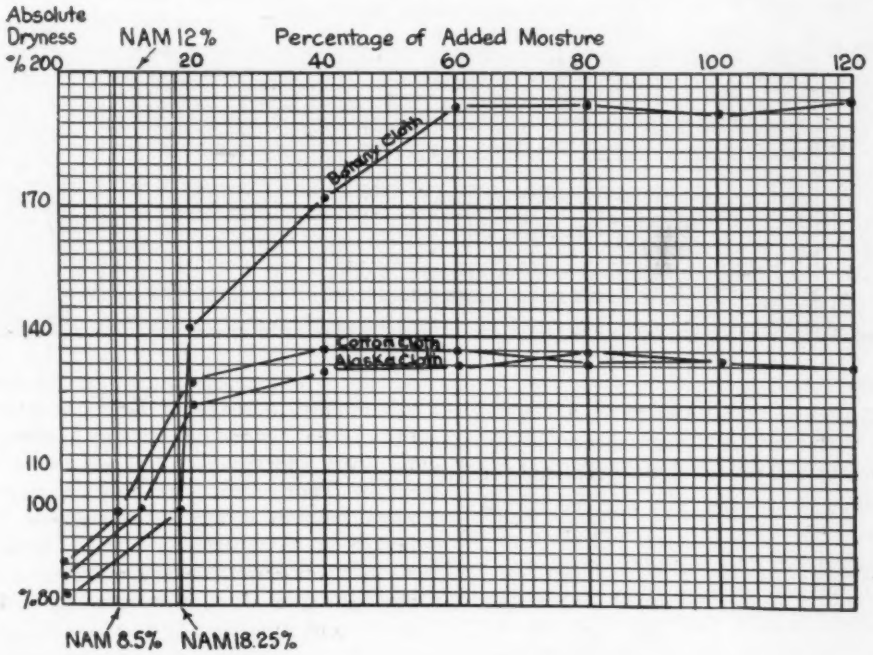


FIG 10. PERCENTAGE ELONGATION OF GREY AND FINISHED CLOTHS, WARP+WEFT



there is only a slight difference recorded between the results of the three machines.

Figs. 11 and 12 illustrate graphically the results obtained on testing the strength and elongation of 2/48s Botany, 40/2 spun silk and 2/40s cotton yarns. In Fig. 11 it will be seen that there is a gradual depreciation in strength of the Botany yarn, a corresponding though less marked depreciation in strength of the spun silk yarn, while in the cotton yarn there is a gradual increase in the strength as the percentage of moisture is increased in each case. In Fig. 12 it will be seen that the increase in elongation of the Botany yarn due to the addition of moisture is very marked, there is also an increase in elongation in both the spun silk and cotton yarns, though much less marked than is the case with the Botany yarn.

From the foregoing tests the following deductions may be made:

(a) That yarns and fabrics made from animal fibers decrease in strength and increase in elongation, and yarns and fabrics made from vegetable fibers increase in both strength and elongation when moisture is added, the increase or decrease varying in each case according to the percentage of moisture added.

(b) That yarns and fabrics made from animal fibers increase in strength and decrease in elongation, and yarns and fabrics made from vegetable fibers decrease in both strength and elongation when tested in an absolutely dry condition.

FIG.11. SINGLE THREAD TEST OF STRENGTH

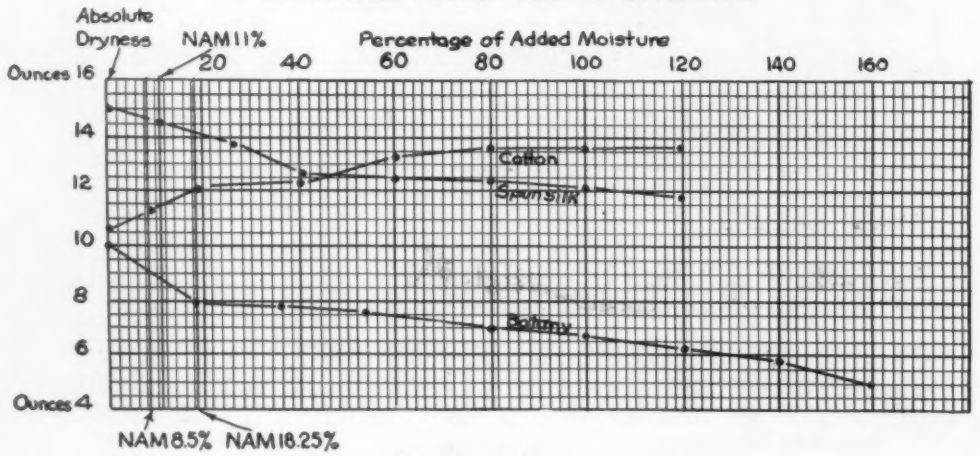
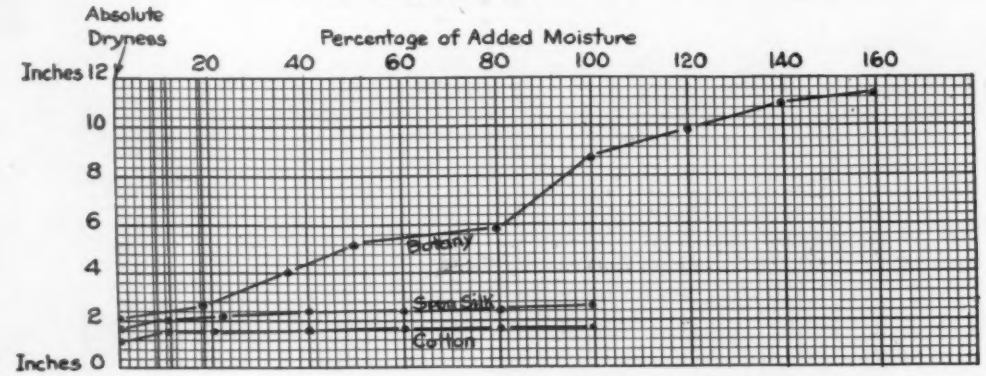


FIG.12. ELONGATION



Questions and Answers

Under this head we undertake to answer, free of charge, to the best of our ability, questions pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD RECORD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

If the question is not of general interest to textile readers and involves expensive investigation, a charge covering the cost may be made, of which the inquirer will be advised before any expense is incurred.

UNEVEN BLEACHING

Editor Textile World Record:

Referring to the reply to our question No. 1996, which appeared in the March issue, it is evident that "Delco" does not understand our method of bleaching, for he describes causes and results for bleaching cloth in the roll. The cloth we had in mind is first boiled in the kier, from the kier it is run through what is known as the continuous bleaching process, which is so well known that it hardly seems necessary to describe details in connection with this method. The two samples which we forwarded to you were cut within a space of two feet from the same roll of cloth. Yet, as you undoubtedly noticed, the shades were quite different. Bleacher (2006).

The first question was so indefinite that I had to draw my own conclusions as to how the goods were handled. As the process of bleaching knit goods in the roll is used more than any other I concluded that that was the process "Bleacher" was using. Even the question as stated above is indefinite. "Bleacher" states that the goods are first boiled in the kier, but does not state how they are boiled in the kier, whether in rope form or in the roll. The cause of the difficulty, however, is at once apparent, especially if they are chemicked in the open roll, that is, winding from one roll through the bleach and on another roll until the bleach is complete. There are so many different methods of bleaching by what is known as the open bleach that it is very difficult to determine which one is used unless it is specified. For instance, there is the method of boiling in the open width which is done in the kier, again there are several methods of running the goods through the bleaching liquor in the open width. All these methods have one object in view, namely, to obtain an even bleach on the goods. In the case cited above the trouble is doubtless caused in the kier during the boiling process. If the goods are put in the kier in rope form uneven packing in the kier will result in uneven dyeing. As I stated in my reply to "Bleacher's" first inquiry the goods are certainly unbleached, which is sure to cause the trouble complained of. Delco.

STAINS ON WOOL GOODS

Editor Textile World Record:

Please state which is the best method of removing stains from woolen cloth after it is sponged. Finisher (2008).

"Finisher" will find a long article on removing spots from textile fabrics in our October, November and December, 1911, issues.

WORSTED VOILE

Editor Textile World Record:

I would like to have some information on the manufacture of all worsted voile dress goods. Manufacturer (2010).

This question was referred to our French correspondent who resides in a district where the manufacture of voile is an important industry. He replies as follows:

The manufacture of voile is carried on in ancient Picardie, the goods being dyed and finished at Amiens and Roubaix. These fabrics are used for ladies' dresses, also for clothing for the religious orders. They are all woven with a plain weave, the set of the cloth varying widely. Following are the particulars for five samples which I enclose:

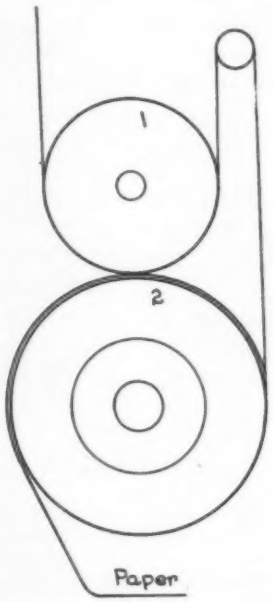
Sample 1

Width in the reed, 51.2 inches.
Width from the loom, 49 1/4 inches.
Width after dyeing, 47 1/4 inches.
Warp, 48 threads per inch 2/53s worsted.
Filling, 44 picks per inch, 2/53s worsted.
Weight, 3/7 ounces per square yard.

The selvage is made with 50 threads of 2/53s worsted. Reeded 2 threads in a dent,

Sample 2

Width in the reed, 49 1/4 inches.
Width from the loom, 47 1/4 inches.
Width after dyeing, 45 3/4 inches.
Warp, 63 threads per inch, 2/71s worsted.
Filling, 61 threads per inch, 2/71s worsted.
Weight, 3.84 ounces per square yard.



ARRANGING THE ROLLS AND WINDING THE PAPER WITH THE CLOTH.

Sample 3

Width in the reed, 50.4 inches.
Width from the loom, 48.8 inches.
Width after dyeing, 47 1/2 inches.
Warp, 47 threads per inch, 2/66s worsted.
Filling, 48 threads per inch, single 26 1/2s.
Weight, 3.36 ounces per square yard.

Sample 4

Width in the reed, 50.4 inches.
Width from the loom, 48.4 inches.
Width after dyeing, 46 1/2 inches.
Warp, 51 threads per inch, 2/62s worsted.
Filling, 46 threads per inch, 2/62s worsted.
Weight, 3/3 ounces per square yard.

Sample 5

Width in the reed, 49 1/2 inches.
Width from the loom, 47 1/4 inches.
Width after dyeing, 45 inches.
Warp, 51 threads per inch, 2/86s worsted.
Filling, 51 threads per inch, single 41s.
Weight, 2 1/2 ounces per square yard.

For voiles of high grade the yarn is first singed. The manufacture of those goods requires much care in weaving. It is necessary to keep the warp beam, back rest and breast beam exactly parallel. The warp beam should move regularly without any slipping. The ordinary Hodgson and Hattersley looms built in Bradford, England, are generally used for this class of goods. The only special feature in connection with the weaving of voiles is the winding of the cloth on the breast beam. A sheet of heavy paper is wound with the cloth so as to keep the folds of the latter from coming in contact with each other. The accompanying diagram shows the manner of arranging the rolls and winding the paper with the cloth. The roll, 1, is a driving roll; the paper is wound on roll 2.

The ordinary processes of dyeing and finishing are employed for voiles. The goods are first singed in the ordinary singeing machine. The distance between the gas jets and the cloth does not exceed 3/4 of an inch. The speed of the cloth is about 38 yards per minute. The cloth is then fixed, this process having for its object to set the threads permanently in the position they occupy when the cloth comes from the loom. The goods are fixed wet and at a high temperature. The sizing is first removed by running the goods through water at a temperature of 100° to 120° F. The machine used for this process has two bowls, the first one contains the water for removing the size, while the second contains hot water which fixes the threads in position. After leaving the fixing machine the pieces pass through a bath of tepid water and then between squeeze rolls. The succeeding operations such as washing, drying and mordanting are similar to those ordinarily employed for other goods.

Voiles are dyed ordinarily in a double jigger, which give the most uniform results. After dyeing, the pieces are sized slightly

and then dried on a tenter frame. The cloth is then wound on a perforated roll and steamed to impart the handle desired.

Gaul.

[Samples of these goods can be seen at our Boston office.—Ed.]

CLOTHING FOR NAPPING ROLLERS

Editor Textile World Record:

Which is the best method of clothing napping rollers, clothing the rollers dry with heavy tension on fillet, or first applying a coating of some sort of adhesion or glue? If the second method is the better, how is the glue made and where can it be obtained? Laconia (2004).

I would advise clothing the rollers dry with heavy tension on fillet, or first applying a coating of some sort of adhesive. Both methods are used and both have their advocates, depending largely upon the character of goods to be napped. Clothed simply with heavy tension the teeth are more rigid and would be rather harsh on soft yarns. When using an adhesive substance, the clothing should be drawn tight, but so that the teeth will yield appreciably to back or side pressure with the thumb, in other words, possessing a little elasticity. This method is preferable on soft yarns. When winding fillet a thin piece of steel from 1/32 to 1/16 inch thick should be kept between the coils of fillet on the top of the roll to be covered. This sheet of steel is shaped on one side to the contour of the roll, and this edge is kept in contact with the roll between the coils while winding clothing to ensure uniformity of the space throughout the wind. This permits of a little spreading and settling of the clothing to a perfect surface.

"Corn Hill" asks how to estimate the counts of fillet for napping machines? The reply in full would be a long story, but for ordinary purposes the following will answer:

Multiply the number of noggs in one inch by five, counting lengthwise of fillet on one rib.

It is as necessary to get the number of crowns. In 1 1/2-inch fillet, for instance, count the crowns in one nogg across the fillet. If there are three crowns in a nogg, there are eighteen crowns in 1 1/2-inch fillet, and in one-inch fillet there would be 2/3 of 18 crowns or 12 crowns. The same rule is used for other widths. The angle of tooth above the commencement of bend usually varies from 27° to 33° Steel Spring.

BOILING OFF SILK KNIT GOODS

Editor Textile World Record:

I expect to be called upon to knit silk with the gum in it and would like to know the best formula for removing the gum after knitting. Can you give me some information on this subject.

Knitter (2013).

The first requirement is soft water and the second good soap containing no free alkali and a large percentage of perfectly saponified fat. White curd soap, guaranteed neutral, is principally used for discharging silk gum in England and the most careful users find that it pays handsomely to buy the very best in the market. It pays waste-silk spinners, for example, to buy a make of soap costing 25 per cent. more than the best quality that second-rank soap boilers can produce. The cheaper soap gives them approximately as good a luster and handle as the best soap, but the effect of the alkali shows itself in the subsequent loss in the form of waste. Free alkali weakens and destroys silk fibers, causes them to be brittle and to break and leads to a large production of fly-waste. The fact is mentioned to emphasize the desirability of using the best quality. There are other reasons than those of strength because a dark soap will be prejudicial to the color and an inferior soap, although it may produce a good white to begin with, may lead goods treated with it to turn brown later under the action of sunlight.

It is advisable to use a soap containing about 64 per cent. of fat and 11 per cent. of alkalies and the strength of the solution to employ depends somewhat on the class of silk used. Probably 10 to 15 pounds of soap for 100 pounds of goods will be sufficient with one to two hours' heating at 180° F. The goods will lose about 25 per cent. in weight. They can be "scrooped," if need be, by treating them finally in a weak solution of acetic acid. James Strand.

TYING KNOTS

Editor Textile World Record:

I would like to have information regarding the different kinds of knots used for various purposes.

Martel (2002).

The following article on different kinds of knots is by Edmond Leclerk, and was published in France a few years ago:

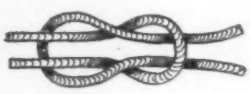


FIG 1.

FIG. 2.

FIG 3.

The accompanying diagrams show not only the different kinds of knots used by weavers, but also several employed for various other purposes. Fig. 1 is a square knot and used for fastening two ends of a thread together. Fig. 2 is a weaver's knot and serves the same purpose as the preceding one; it has the same advantage of not slipping, and does not form a thick place or bunch in the yarn. It is the most solid knot and preference should be given to it in textile mills. Fig. 3 is a draw knot, used for splicing broken warp threads in the loom; its construction permits the desired tension to be applied to the thread. Figs. 4, 5 and 9 are various forms of slip knots used for tightly binding bundles. The knots shown at Figs. 6 and 8 are frequently used for mounting heddles as they enable the cord to be shortened or lengthened as desired. Fig. 7 is a knot used for uniting several threads in one loop. Fig. 10 shows a combination of knots

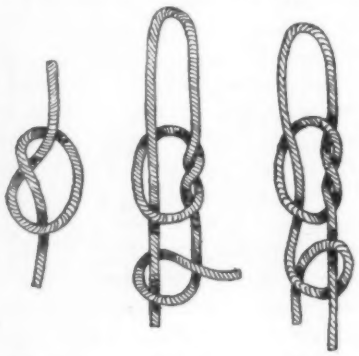


FIG. 4. FIG. 5. FIG. 6.

FIG. 13. FIG. 14. FIG. 10

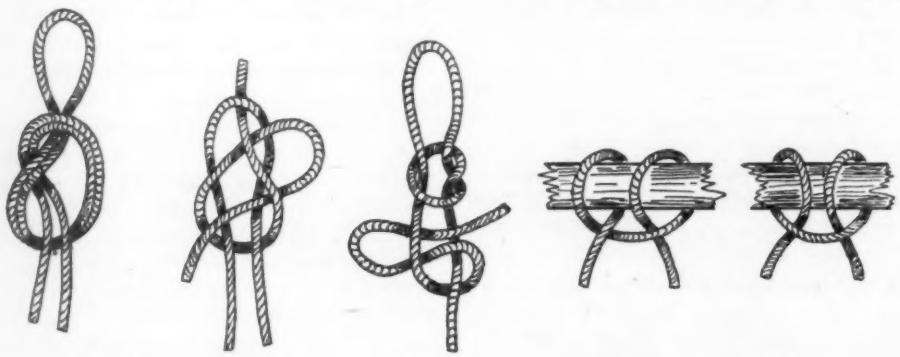


FIG. 7. FIG. 8. FIG. 9. FIG. 11. FIG. 12.

used in connecting the levers of a loom with the shafts. Fig. 11 is a mason's knot, used for fastening rope to objects to be lifted or drawn. The more the rope is pulled the tighter the knot becomes. Fig. 12 is another form of slip loop, but it is not as good as that shown at Fig. 11. Fig. 13 is the mariner's knot used for suspending heavy weights and well adapted for large rope. Finally we should not forget the apprentice's knot, Fig. 14. Its size and the facility with which it slips make it unworthy of use anywhere.

CORRECTION

A correspondent calls our attention to a typographical error which occurred in the reply to the question regarding the numbering silk yarn on page 540 of our February issue. The equivalent of the denier aune standard for silk is 4,442,112 yards per pound, instead of 4,422,112 yards as given. The so-called metric standard adopted some years ago by one of the many metric congresses that have been held in Europe is based on 1/2 decigram per 450 meters. This is equivalent to 4,464,601 yards per pound. The difference between the actual denier standard and the metric standard is negligible in practice, being approximately one-half of one per cent., or to be exact, one one hundred and ninety-seventh.

DYEING COTTON DUCKS

Editor Textile World Record:

What is the best method of dyeing heavy, close woven cotton goods to ensure perfect penetration, such as heavy ducks?

The best method of dyeing union felts and also all wool felts to ensure perfect penetration?

The best method of dyeing rabbit fur in loose condition to ensure even results without felting during dyeing? Dyer (1990).

Closely woven cotton goods such as heavy ducks, are dyed in one of two ways, either in a jigger or padding machine, the former, however, being the apparatus most commonly employed on account of the better facilities it affords for securing good penetration. As penetration is a factor of density, the closeness of the weaving may not have as much influence as the hardness of the twist of the yarns used in the goods.

Sulphur colors always yield superior results on account of their solubility, which should always be taken into consideration where penetration is necessary. Diamine or direct colors may also be used, but in practice the preference will generally be given to the sulphur colors. The use of soluble oil is always advisable as an addition to the dye bath for dyeing all shades, although it is especially desirable when dyeing medium, light and mode shades. It is a mistake to use too strong a solution of dyestuff and attempt to get the full shade in a short time. It is better to use a solution of moderate strength and give a few more runs of the goods through the bath.

A jigger constructed so that the roll of cloth while being dyed should always be immersed. As dyeing usually takes place at or near the boil, it is well to commence operations at a low temperature, say 100° F., and gradually increase to the boil, at the same time "forcing" the bath with small additions of common salt.

The dyeing of union and all-wool felts where penetration is desired is equally important; in this case an ordinary open dyeing machine provided with a winch is ordinarily used. For the unions, the colors to be used must be selected having about the same relative solubility and which are slow dyeing, a much longer time is necessary in the dye bath for these goods and the operation should commence at or about 100° F. and allow sufficient time to run to ensure penetration of the goods with the dye-liquor before the color is sprung by adding salt or giving more heat. It is simply a question of more time being allowed than for similar weight goods of lighter weave. The same principle holds good for all-wool felt, easily soluble, slow dyeing colors to be used and the addition of acid to spring the shade should be gradually added long before the bath actually boils. In dyeing felts of any kind and especially where penetration is necessary requires that all traces of soap shall be removed from the goods by thorough washing before dyeing.

The dyeing of rabbit, or any other loose fur should always be done in a pack machine. In such an apparatus the fur is held immovable while the dye liquor by means of a rotary pump is circulated through the mass

of fur being dyed. By this means the fur is dyed an even shade and under the circumstances no felting whatever is possible and after washing, the material is removed from the machine in a perfectly free and lofty condition. Louis J. Matos.

LONDON SHRUNK PROCESS

Editor Textile World Record:

Can you give me the best way of shrinking worsted goods in the piece? Please state whether the London or steam shrinking process can be done in a quick way. Sponger (2009).

The "London shrunk" process consists in dampening the goods heavily, either with a "dewing" machine or by rolling the pieces between the damp leaders. After the cloth absorbs sufficient moisture, the pieces are pressed in a plate press. In this way all stretching of the goods, either widthways or lengthways is avoided. This process is rather laborious and slow. In order to obtain a larger production and reduce the cost of labor, some mills use a different process which they nevertheless call "London shrunk." Ordinarily it consists in dampening the cloth lightly on a "dewing" machine. The pieces are then run through a rotary press which stretches them lengthways. They are then dampened again lightly on the "dewing" machine and pressed a second time in the rotary, which stretches them still more. This process naturally results in leaving the fabric in such a condition that it will shrink when sponged. The process is wrongly called "London shrunk." Finisher.

MANUFACTURING JERSEY SWEATERS

Editor Textile World Record:

Enclosed is a sample sweater such as we would like to make. We would thank you to give us the kind and sizes of machines that will knit sizes from 28 to 44. Please advise if there can be more than one size knit on a machine.

Duluth (2014).

This garment can be made in all sizes on a 30-inch spring needle machine. When using a machine of this size it is necessary to cut different sized garments together in order to avoid waste. The garment can also be made on an open top latch needle machine, sometimes called the sinker top machine, owing to its having a ring of sinkers to hold the work down on the needles, which has the advantage of knitting a tighter stitch. It is possible to make two sizes of men's sweaters and also the boys' sizes on the same machine by cutting the different patterns at the same time. A 17-inch machine would give body sizes 34 and 36; a 19-inch machine would give body sizes 40 and 42; a 21-inch machine would give sizes 42 and 44. The sleeves can also be cut from the goods knit on the 21-inch machine. The garment sent with this inquiry is made with 11 cuts or 11 needles to the inch. This gauge is suitable for knitting 2/20s to 2/32s worsted or single 8s to 10s cotton. The garment has a very poor collar and cuff. I would suggest a 7-inch latch needle machine having 140 needles which would give a collar without a seam in it. This would improve the appearance of the sweater. Delmar.

NUMBERING SEWING THREAD

Editor Textile World Record:

Please inform me how sewing thread is numbered. I find different methods described in text books, and tests of thread from different manufacturers indicate that the system varies in different mills. Frankford (2014).

"Frankford" is right in his conclusion that manufacturers of cotton thread number their product by different systems, the result being confusing to the buyer and user. The cotton thread made at Paisley, Scotland, was originally made three-ply and the number indicated the size of the single strands out of which the three-ply was made. Thread Nos. 10, 20, 30, 40 and 50 were made out of three strands of single yarn, Nos. 10, 20, 30, 40 and 50 respectively. When the thread came to be made six-cord, the thread numbers were retained, although it was made with a single yarn twice as fine as before. Therefore, at present six-cord thread numbers 10, 20, 30, 40 and 50 are made from six strands of single yarn Nos. 20, 40, 60, 80 and 100. The cotton count used for thread is the same as used for cotton yarn, indicating the number of 840-yard hanks per pound. This Paisley system has been abandoned by many manufacturers with the results indicated in "Frankford's" question. When a buyer is in doubt as to the meaning of the number applied to thread, he should if possible buy on a basis of so many yards per yound. In the case of sewing cotton the length is marked on each spool.

Knitting Department

THE KNIT GOODS SITUATION

From observations made by the writer during a trip through the Mohawk Valley in the month of March, it is apparent that most manufacturers are fairly well satisfied with the business now on their books on heavy weights. None were sold up, but it was felt by many that they were in a better position by reason of not being so, than if their books were filled with orders at the prices that goods were offered at during the months of January and February. It is pointed out that buyers have now begun to realize the necessity of paying higher prices and the manufacturer who still has part of his output to sell can get more for it than if he had sold up earlier. Buyers have been duplicating to quite some extent, showing that their travelers are meeting with some success in getting business from the retailers, but up to the present time, there has not been any general movement to get under cover for the entire season's requirements.

Some of the larger manufacturers of men's fleeced goods have advanced their prices, 10 to 12 1/2 cents per dozen and nearly all the manufacturers of men's 11 and 12 pound ribbed goods have made advances of 7 1/2 to 12 1/2 cents. One line of Southern made ribs has been entirely withdrawn from sale. There is still one State made line of ribbed goods, 12 pound weigh quoted at $3.25. The shirts are made with sloped shoulder and the drawers have pearl buttons. The Stewart line of the same weight may be had at $3.12 1/2 for late delivery. This concern reports a larger business on the Interlock line made of carded yarn which they have sold this season at $3.50 per dozen, than formerly. These goods weigh about 10 1/2 pounds, are made on larger heads than last season and bid fair to become a popular selling line.

Women's carded yarn vests and pants, weighing 6 pounds to the dozen sold recently at $1.70, have been generally advanced to $1.75 and the 7 pound lines which were quoted at $1.85 have been raised to $1.90, while those weighing 8 pounds that were sold in the month of January at $1.90 have been withdrawn from the market entirely.

One of the large factors in the manufacture of children's goods states he has advanced his price on all lines of children's fleeces 5 cents5 per dozen, and on all lines of ribbed goods, 2 1/2 cents. It is believed that there are a great many buyers who have bought only a very small proportion of their season's requirements on this class of merchandise and it begins to look as if it would be necessary for these buyers to pay advances on a large share of their purchases of children's goods.

Light weight underwear of all descriptions has been in active demand during the past two months. Not that there has been any great call by the consumers, but manufacturers and jobbers have been very busy, filling their orders.

One of the larger jobbers has called our attention to the fact that the advance business for spring usually given during the months of October and November fell considerably short of previous years, but that since January first, retailers have placed orders very freely. This action on their part is reflected in the active demand by the jobbers, and at the present time, many makers cannot take duplicate orders, except for very late deliveries. This is especially true on lines of women's shaped goods.

Manufacturers of women's straight vests report a good demand for the better class of merchandise, especially for the sheer gauze weights and mercerized lines to retail at 25 to 50 cents a garment.

The Ardsley Knitting Co. of Brooklyn have just brought out a silk straight ribbed vest at $6.00 per dozen which buyers are taking quite freely. It is a plain trimmed garment and being so much lower in price than a silk vest has been offered for in previous years, has found a very ready sale.

Manufacturers of nainsook underwear for men are all in a well sold up condition and jobbers report that there is no abatement in the call from retailers for this class of goods, especially union suits.

The Girard Company are delivering large quantities of a men's checked nainsook suit made in sleeveless and knee length at $3.75 per dozen.

HOSIERY

The extremely cold weather of the past three months has had the effect of cleaning up stocks of wool and fleeced hosiery to a considerable degree and manufacturers of these lines report that there is a general disposition on the part of buyers to operate with more interest than usual for the coming fall. As a consequence of this, several of the more important manufacturers of fleeces have sold up a good share of their production for next season and on some lines, advances of 2 1/2 to 5 cents per dozen are being obtained.

Nearly all lines of light weight hosiery are in good demand at the present time. As in the case of underwear, early orders were not large and now that the season is on, buyers are fairly clamoring for the delivery of desirable lines. Manufacturers, of course, have been working only on orders and making up no stock, and now with the time for delivery greatly lessened, are unable to supply the demand. This is more especially the case in all lines of fashioned goods and we learn of many instances where jobbers have asked for the best dates of delivery obtainable, and they have been informed that all the way from July to September are the best delivery dates that may be had.

The indications are now that the present year will be a particularly strong white season and nearly all manufacturers are sold up to July and on some of the finer gauges to September. It is also very evident that tans will be in good demand for men' women and children. Pink, sky, lavendar, navy and grey continue fairly popular.

One important move on the part of several manufacturers of late has been the withdrawal from the market of the low grade silk goods that had been offered at prices to permit them to be sold over the retail counters at 25 cents a pair, and instead of handling goods at this price are devoting their efforts and time to the 50 cent grades. These are being improved over the qualities offered early in the season and very handsome lines are being shown now at $3.50 to $3.90, some with a wide range of colors, numbering as many as 27 different shades. It is found that ladies are often desirous of matching up shades of gowns with hose to match.

A pronounced demand has recently developed for the champagne shade, and there are those who predict a big business for this color before the season is over.

THE 1912 EDITION OF THE "AMERICAN DIRECTORY OF THE KNITTING TRADE"

The new edition of this directory frequently called in the trade the "Red Book" has been published. No publication is better known in the knit goods trade than this little book, which has been the reference book of the knit goods manufacturers for thirty years. A complete description of its contents will be found under the head of "New Publications" in another part of this issue. The price is $1.50.

The "Knit Goods Trade" containing the dry goods section and jobbers' list of the directory, but without the mill reports, has also been published. The price is $1.00.

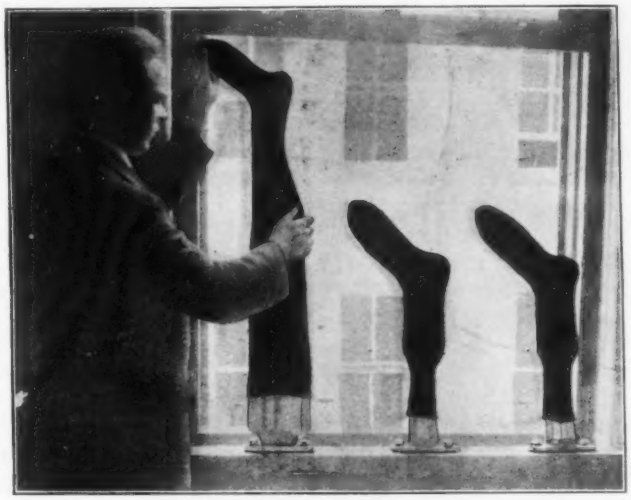
LATEST AUTOMATIC KNITTING MACHINE

Paxton & O'Neill, 537-39-41 N. 3rd St., Philadelphia, are now making deliveries of the latest full automatic knitter, their latest yarn changing plating machine, for which they claim the advantages of the finest work in silk, mercerized and cotton, good production with small proportion of waste, smoothness of operation, and designed to give satisfaction to the most exacting manufacturers. The machine will be shown in operation at the coming Exhibition of the National Association of Hosiery and Underwear Manufacturers in May, when all interested will have the opportunity to judge for themselves of its merits.

ERMENTROUT'S METAL BOARDS FOR DRYING HOSIERY

A new device for drying hosiery is the metal hose board shown in the accompanying illustration, and put on the market by W. D. Butz, Room 625, Bourse Bldg., Philadelphia, Pa. This board is hollow and is heated by steam introduced in the interior at a low pressure of 4 pounds, giving a temperature of 220°, which is ample for this purpose. The pressure is kept uniform by a regulating valve. A dozen or more boards are mounted at a proper angle on a regular boarding table. The boarder starts at one end of the line putting the hose on the boards. By the time he reaches the seventh or eighth board the hose on the first board is dry and the helper can then begin to remove the goods in the order in which they were put on. This assures continuity of operation. The dry box is eliminated entirely. The boards are stationary and do not have to be handled. The stockings slip easily over the polished metal and there are no rough or splintered edges to damage the goods. The metal boards are claimed to be indestructible. The metal is heated quickly, retains the heat and dries the hose rapidly. As a result only a small amount of steam is required for this process; no power is necessary. The stocking is dried from the inside, which is claimed to be an advantage in the manufacture of silk hosiery. Another advantage in the making of silk goods is the doing away with pressing, as the stockings are ready for boxing as soon as they are removed.

The construction of the board insures the stocking being put on straight. For full fashioned and looper seam the boards are grooved for the seams, making it difficult to get the stocking crooked.



METAL HOSE BOARDS FOR DRYING HOSIERY.

The boards are supplied for infants', children's, misses', ladies' and half hose, in all sizes and shapes. Each board occupies only one foot of table space. While steam is advised by the makers the board can be equipped for heating with hot water, gas or electricity. These boards are sent to manufacturers on trial.

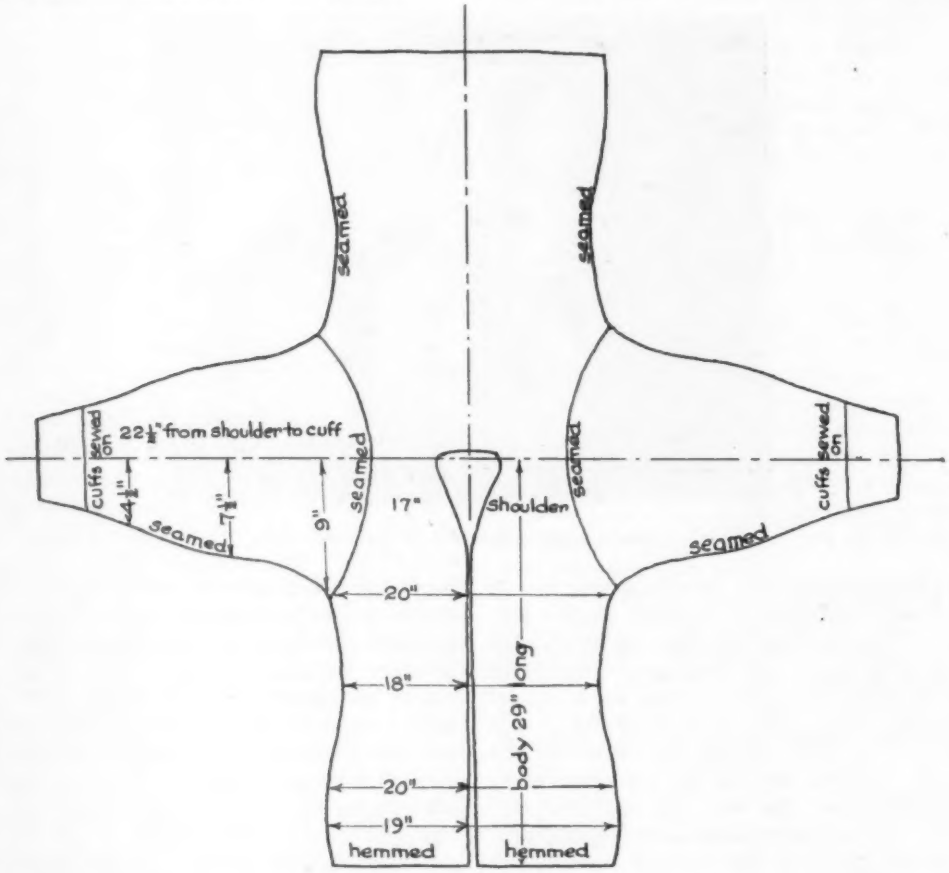
ELECTRICALLY HEATED HOSIERY BOARDS

The General Electric Company will show in their space at the Hosiery and Knit Goods Exhibition in Philadelphia, a new development in the line of electrically heated hosiery boards for drying hosiery. A full description of this new device will appear in the May issue containing the report of the Exhibition.

MANUFACTURING JERSEY SWEATER COATS

BY DENBIGH

The Jersey sweater coat is much worn during the spring and fall. It is made somewhat on the same lines as a Shaker coat. The only difference is that it is cut and seamed and of considerably finer gauge. A much finer yarn is used. In starting to knit the cloth for this coat, which is usually made out of yarns ranging in size from 2/18s to 2/32s worsted on from 3 to 10 cut machines, the first operation is winding the yarn. In winding worsted yarn it is a good idea to wind over a moistening roll, as it insures a more even stitch in the cloth, and also a smaller percentage of imperfections. For moistening the roll I would suggest a solution consisting of 1 pint of lard oil and 1 cake of Ivory soap in 2 1/2 gallons of water. Boil well until the soap is dissolved and then put into a tin trough with a tin roll connected so that it will turn with the yarn running over it. This will moisten the yarn so that it will knit well. The hardest yarns treated this way will soften up and become pliable. After this operation begin the knitting on a 1-inch cylinder, for a size 40 coat. This will give a cloth 20 inches wide. After taking the cloth from the knitting machine steam thoroughly and let stand until the morning, if possible. If this cannot be done then let the cloth stand for two or three hours and put it over a hot roll laundry ma-



chine which will set the cloth and give a smooth, even finish with some luster.

The cloth is now ready for cutting. For a size 40 coat the garment is usually cut 29 inches long, allowing 1 inch to turn up for the hem, and in width is tapered from 17 inches at top of shoulders down to 20 inches at bottom of armhole. Then from 18 inches at waist down to 20 inches at hips, and to 19 inches at hem. The cuff should be about 3 1/2 inches long after seaming or sewing into sleeve. The sleeve will finish 22 1/2 inches from shoulder to end of cuff. The sleeve should be cut so that it measures about 9 1/2 inches at the shoulder, tapering down at elbow to 7 1/2 inches, then down to 4 1/2 inches where the cuff is sewed on.

The first operation after cutting is to seam up the sleeve, which is done after turning the cloth on the wrong side. Then the shoulder is seamed up and next the sides of the body, which reduces the width about 1/2 inch. Then the coat is taken to the hemming machine which turns up about 1 inch into a hem which finishes the bottom of the coat. Then sew the cuffs on the sleeves. Next place the sleeve inside of the armhole with the seamed part at the bottom of the armhole and sew the sleeve into the body. After getting all the parts together take the garment to the covering machine, which is a twin needle machine, the object of which is to give a finish to all the seams and lay them flat, and also to cover up the rough edges. After covering all the seams lay the coat flat on a table. Measure carefully to the center and cut up until about 10 inches from the neck. Then cut at an angle of about 45° on each side to the top of shoulders. Remove the V piece left after cutting at this angle. The coat is now ready for the trimming, which is usually 2 1/2 to 3 inches wide and doubled over so that the coat edge is between the trimming edges. The trimming is always started at the bottom of one side of the coat and sewed up and around the neck and down the other side to the bottom. When the bottom is reached cut the trimming off and edge over the bottom edge of the trimming with a special machine built for this purpose.

The coat is now ready for the buttonholes. Make six of these holes about 2 1/2 inches apart, the first one to be about 1 1/2 inches from the bottom of the coat. Next the buttons are sewed on by a button sewing machine. The pockets are next sewed on, and are usually about 5 inches wide and 4 inches deep with the top turned down about 1/2 inch. These should be sewed at bottom even with the top edge of the hem and about 2 1/2 inches from where the trimming is sewed on the coat. The coat is now steam pressed, laying it out flat and press folded in the sleeves, giving it a light press. Fold again and it is then ready for boxing. This makes a very serviceable coat for spring and fall and can be worn by either ladies or men. It retails at from $1.75 to $3.00 a garment according to the weight and quality of yarns.

This coat is also made in a turtle neck, cape collar, v neck, or in an automobile coat.

THE EASTMAN CUTTING MACHINE

The advantages of the Eastman cutting machine which is manufactured by the Eastman Machine Co., Washington and Goodell Sts., Buffalo, N. Y., are illustrated by the results obtained in the cutting room of the Globe Knitting Works, Grand Rapids, Mich., a view of which is shown at Fig. 1. This knitting company, which is one of the largest manufacturers of knit underwear and union suits in the country, has reduced the number of operators in their cutting room about two-thirds, by introducing the Eastman cutting machine model U, shown at Fig. 2.

The knit goods are laid from six to eight inches in height and the entire lay is cut with the Eastman machine in the same length of time that it would take a girl to cut two or three thicknesses with the shears. The goods are cut uniformly from the top to the bottom of the pile. The result is a great increase in production and economy of labor, combined with improved workmanship.

The Eastman cutting machines have been

in successful operation throughout the country for many years and the latest model embodies a number of improvements which

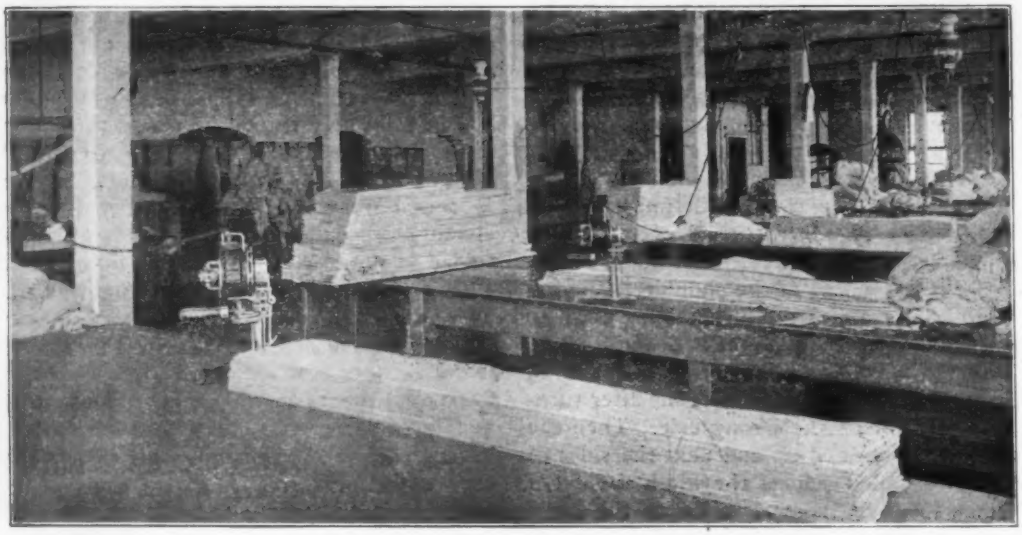


FIG. 1. CUTTING ROOM OF THE GLOBE KNITTING WORKS USING EASTMAN MACHINES.

have been the result of previous experience in this line of work. The leading features of

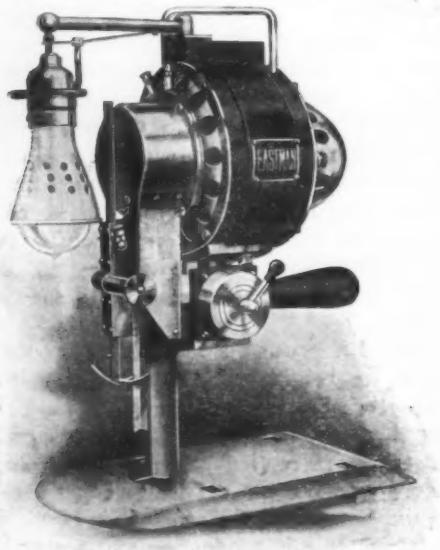


FIG. 2. MODEL U. EASTMAN CUTTER.

the model U machines are great durability, capacity for high speed and ease of operation. The new presser foot used on the model U is a positive prevention of accidents, making it practically impossible for an operator to be cut while operating the machine, as the hand will be pushed out of the way before the knife reaches it. The switch is placed close to the handle where the operator can throw it with the thumb without taking the hand from the handls of the machine. This leaves the left hand free to hold the goods from stretching and increases the rapidity with which the goods can be cut.

The Eastman Machine Co. have also recently placed on the market a machine for cutting low lays of soft goods. This machine is of the rotary type and has a number of valuable features. The standard is so arranged that by turning the thumb screw the entire knife may be lowered into or raised from the plate, thereby enabling the knives to be used without putting steps on the plate. The machine also has a positive sharpening device which can be operated by drawing the lever without bringing the fingers in contact with the knife.

The supply of cotton in the United States for the year ending August, 1911, was 13,873,423 bales.

MILL EXPERIENCES

Under this head we will publish from time to time stories from practical mill men, telling of vexatious and unusual difficulties which have occurred in different branches of mill work, and how they have overcome them. We invite mill men to send us an account of such experiences. We pay, of course, for all that we use. Facts told just as you would tell the story to a friend are what we want, not fancy writing.

A KNITTER'S EXPERIENCES

BY BRISTOL

I have had a great many years' experience as a foreman in knitting mills, but the one I recall most vividly is with a mill in the East. The mill was one of the oldest in the country and I always had an idea that I would like to work for these people. So when I got a letter from them offering me a good salary to take charge of their cuff knitting room, I accepted immediately, leaving a position in the West to do so. I landed in the Eastern city in the middle of January expecting to see a mill that was up to date. Imagine my surprise when upon entering the mill I found that the machinery was of old design and nearly worn out. On the following morning I examined carefully the machinery in my department. I never saw such a hard looking lot and the man who had had charge of the room had worked nearly all his life in this mill as a full fashioned knitter. When the cuff knitter resigned he asked the superintendent for the position as foreman. As the superintendent had some experience on this class of work he concluded that he would give him a trial.

There were 22 machines. Eighteen of these machines each had from two to four sections and not one of them had more than one section working and that one in every case was doing imperfect work. The superintendent informed me that about two-thirds of the goods they did make was waste. He then took me into the looping room to show the pile of goods that were waiting for cuffs and ankletts. One pile of about 500 dozen was on the floor. The superintendent was very anxious to get these goods finished as they were sold and due on orders. The old foreman took me around and showed the machinery. He said they were beyond repair and what was wanted was new machines. He thought it was impossible to fix them, but I told him I thought I could change his mind about that after a while. As he was going back to the full fashioned machines I knew he would be there to see what was done.

The first day I put in looking over the machines and getting a line on where to start in. As some of them were of such old design that it would be impossible to get parts at the factory, and as there was a first class machine shop connected with the factory it was up to me to have made what I needed. I started in to take one machine apart at a time, trimming the bars and getting new cams made. In taking the first machine apart I found it was so heavily gummed with oil that it could not be cleaned without boiling in a solution of alkali, which I did, finding it pretty hard to start some of the oil. On examining some of this gum I found that it was castor oil and shellac. These machines have a sinker bar that holds the sinkers and these sinkers are what are used to form the stitch, being driven by a bar called a slurcock bar. When the stitch is formed in the needles the needle bar draws back and the sinker bar lifts up, lifting the sinkers out of the way. When these sinkers are up the adjustable springs for each section press against the side of the sinkers, holding them up out of the way of the carrier bars. When they press the work off or break the needles it is necessary to bend the spring with pliers so that it will hold the sinker where it belongs. I learned later that the former foreman had trouble of this kind and instead of bending the springs had used castor oil. When that failed to do the work he had used shellac, which accounted for the gummed condition of the machine.

After taking the first machine apart, boiling it out, getting new cams and various other parts, I put it together again and then put the work on. After a little adjusting I put on the belt and started it up and it ran well, giving a perfect selvage, which is necessary in full fashioned work. It made cuff after cuff perfectly. The superintendent came around and watched the work, examin-

ing the cuffs very closely, and remarked that if all the machines will do as good work as that, there would be no question about filling the orders. I told him that it would take same time to get all the machines clean and in working order, but he told me to go ahead and take all the time I wanted, for, he said, if all the machines would work like this one, it would be worth the time spent. I had visitors from all parts of the mill to see the machine run, as it seemed a novelty to them.

I kept right on taking the machines apart one by one, boiling them and getting the necessary parts together until I had 16 of the American machines running and doing good work. There were two more of these machines to fix up, but they were old and worn so that they had to be run by hand and the stitches pushed back off the needles while making a welt. This is done automatically when the machines are in order. I was amused to find these machines had pet names. One was named "Betsy Ann" because the foreman had to sit beside the machine in order to get any work out of it. Another was called "My Christmas Tree" because the operators thought they hung it on him when they asked him to run such a machine. After a while I had these two machines in running order, and by this time the waste had been reduced and the pile of goods on the floor waiting for cuffs and anklets was steadily growing smaller.

I next took hold of the English and French machines and went over them thoroughly until they were running. When these machines were set up the room looked entirely different from what it did when I first entered it. The waste had been brought down to where it should be and the work was caught up. The superintendent showed in every way possible that he appreciated what I had done. When everything was in shape we were knitting the cuffs and anklettes faster than they could produce the garments, so I asked the superintendent if he could get more work for our machines. He stated that there were three latch needle machines making a very cheap grade of cuffs which they had never been able to knit on any other machines, but that if I thought I could make these cuffs on my machines he would use the latch needle machines for making cloth. I asked him to send up a sample of the yarn which he did and I had it wound and put on one of the machines. It worked well and gave the knitters more work to do.

When passing through the mill I often saw wet cloths lying around all over the floor and upon inquiring what these were for I was informed that they were used to dampen the yarn. They really believed that unless the yarn was wrapped up over night in wet cloths that it could not be used with success. This was an old English idea. I had seen it used when I first learned to knit, and I thought the system had been discarded for newer and simpler methods. It was some time before I could convince the knitters that this was wholly unnecessary. After getting the machinery in shape I had no trouble whatever in knitting the yarn, and it was not long before the other knitters were knitting the same yarn without dampening. Experience had taught me that if holes appear in the cloth, there is a cause for them unless it is in the worsted or hard twisted yarns which will give trouble by drop stitches. When knitting this kind of yarn it is well to use an emulsion, winding the yarn over it, and it will then give very little trouble.

When beginning work I told the superintendent that when the machines were in order I would need some competent help, so he hired two young men that had worked in the mill before. As they were both bright I put one on each side of the room. While I had a machine apart I had one man stay near me, showing him how to set it up and adjust it, and giving him a thorough knowledge of the machine. After spending eleven months with this firm my health failed and I told the superintendent that I would have to go and asked him to accept my resignation. He was very loath to do so and offered me an increase of salary to stay, but as the East did not agree with me I thought it best to go. He asked me where he could get another man. As I did not know of anyone at the time out of a position I asked him to divide the room, giving half to each of the

two young men I had in charge. This he decided to do and I left them at the expiration of my notice with every machine in running order, the waste greatly reduced and with the good will of every man and woman employed in the mill. A year later while passing through the town I stopped off and called at the mill. The superintendent informed me that the young men were doing well and that he was more than pleased with them and that he had me to thank for it. He stated that there were very few knitters that would show anyone what I had shown to these young men. I replied that I got my first experience working with a foreman that would not teach me anything, and that I had to study it out for myself, spending many a hard hour at it, but that when I did get the knowledge I had it for all time. My plan is to teach them all I can, and if they are not capable to get rid of them, as they are then only a hindrance. The more one teaches the help the more work they can do, and the more time will one have to look after the general work. Any superintendent or foreman can always find matters that need his attention.

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There are about 53 mills in Edinburgh, Scotland, employing about 12,500 workers, which produced 12,000,000 yards of woolen and worsted cloth in 1910, requiring about 18,000,000 of clean wool.

ORNAMENTING HOSIERY

An attachment for ornamenting full-fashioned hosiery during the knitting process has recently been patented in this country, and is described by the inventor as follows: Fig. 1 shows the attachment as applied to a flat knitting machine; Fig. 2 is a vertical section of the device. The reciprocating bars, a and a^1, are provided with thread carriers, a^2 and a^3.

On each of the bars, a and a^1, is secured

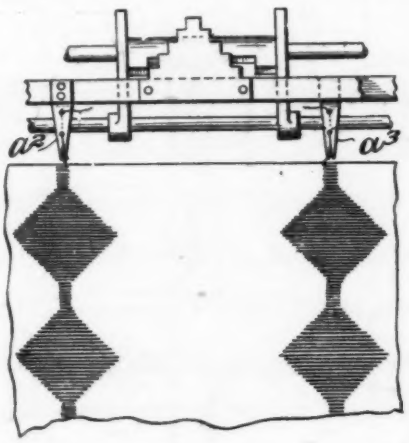


FIG. 1.

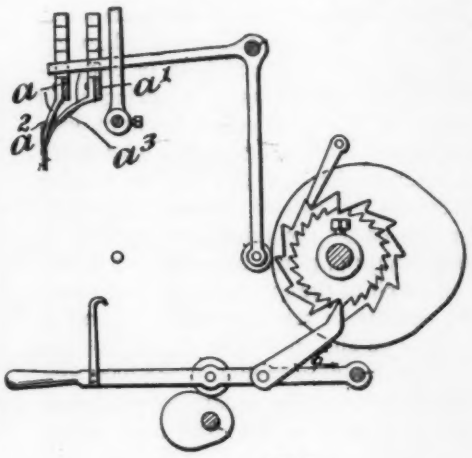


FIG 2

the pattern forming step-like devices, b and b^1. These devices are preferably arranged in pyramidal form and so as to regulate movements of the bars, a and a^1, as well as the thread carriers, a^2 and a^3.

A bifurcated bar is held in the guides of the machine. The bar is mounted on a shaft of the machine and is also provided with a depending extension held under tension by means of a spring. This extension also carries a terminal roll, operated by a cam, with which it is held in engagement by means of a spring. On the cam shaft is secured a ratchet-wheel, and loosely carried on the same shaft adjacent to the ratchet-wheel is a second ratchet-wheel. The teeth of these ratchet-wheels differ in number with respect to each other, as shown in Fig. 2, although they could be arranged each with a like number of teeth and equally good results be obtained. The ratchet-wheel, loosely

mounted on the shaft, has a lesser number of teeth than the ratchet-wheel fixed to the shaft. In the former ratchet-wheel, one or more of the teeth are deeper than the rest of the teeth of the wheel.

A cam is mounted on a shaft of the machine, which actuates a roll journaled to a bar carrying a handle and hook for lifting the same out of the way, when plain knitting is to be done. The bar is mounted at its forward end on a shaft of the machine and between its forward pivotal connection and the roll is arranged a pawl in pivotal connection therewith and normally arranged to engave the ratchet-wheel and held in engagement therewith by means of a spring until a deep tooth of the wheel is brought into position, when the pawl engages with teeth of both ratchet-wheels of the shaft to revolve the latter and the cam to operate the roll of the bar and cause the bifurcated portion of the bar to step up, notch by notch, or down, notch by notch of the pyramidal step-devices.

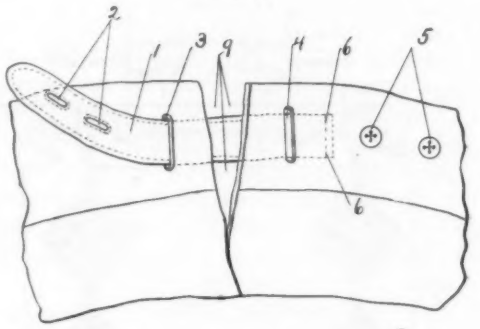
These devices so arranged one in advance of the other as shown in Fig. 2, control the successive throw movements of the bars and also the carriers of the ornamenting thread or yarn in producing the particular ornamental design in the hosiery and during ordinary knitting of the stocking blank, as indicated in Fig. 1. In the operation of the thread-carriers the thread or yarn effect the said results through the bifurcated portion of the bar, being caused to successively step up notch by notch and thus to increase step by step the throw of the bars, to gradually increase or widen the design in the stocking, while ordinary knitting is going on. A reverse movement of the bifurcated bar produces a gradual narrowing of the design in the stocking. This is effected by the movement downward of the bar along the steps of the pyramidal devices, shortening the throw of the bars, as will be apparent from Fig. 1.

Of the total shipments of cotton yarn, the United States is credited with $3,707,271 worth, against $3,366,509 during 1910. Germany leads in this trade, purchasing $25,174,770 worth, followed by the Netherlands with $9,613,766.

FASTENING DEVICE FOR UNDERWEAR

This device for which a patent has recently been issued in this country, is intended to provide means for taking up the undergarment so as to adjust it to the wearer. Fig. 1 shows the takeup partially attached to the rear portion of an undergarment. Fig. 2 shows a similar portion of a garment with the takeup device in position on the garment as worn. A reinforced strip of cloth, 1, having button apertures, 2, is fastened to the upper hand of the garment. One end of this strip is fastened to the inside of the band. The strip then crosses the opening, 9, in the garment, and is passed through the aperture, 3, in the band. It is then lapped backward and again passed inside the garment across the opening, 9, and through the aperture, until one of the button holes, 2, is in position to be placed over a button, 5. The amount of takeup depends upon which of the apertures, 2, is used, and in connection with which button.

FIG. 1.



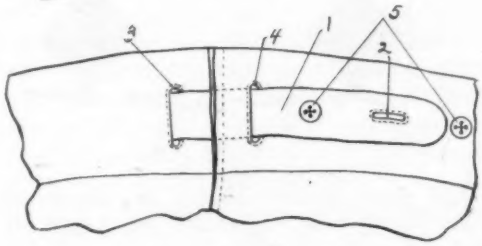


FIG. 2.

The exports of French machine-made laces to the United States during the last six months of 1911 were valued at $2,034,941, or $343,203 less than in the same period of 1910.

Dyeing, Bleaching, Finishing, Etc.

COST FINDING IN A BLEACHERY

BY DELCO

The question of cost finding is a source of trouble to many bleachers. It takes quite a long time to settle down to a system that is simple and easy to understand, and the methods have to be followed out faithfully for a long time before a system is successful. Many manufacturers take the cost of running their plant as a whole and work out a cost sheet on the total production only. Other manufacturers want a departmental cost sheet as well, so that they can find the cost and production of each department. It is a difficult problem to do this accurately on account of the many processes the goods have to pass through. A bleachery that is doing commission bleaching has a more difficult task than a large manufacturer who makes and bleaches his own goods. However, an efficient cost system can be adopted by either the home bleacher or one doing commission bleaching. The method which I will describe has been in use for many years, but it is always possible to improve on any system after it is adopted. It has been found to give good results in a plant having a small output, and also in a plant producing 200,000 pounds per week.

Date	Goods Received From	Their Order No.	Our Order No.	No. OF Pieces	Yards	Pounds	Width	Date to be Shipped	Date Put in Work	Finish	Style	Stock	Remarks
1910													
Feb 6th	J. & Clark's Sons	1006	889	1886	113160	22632	40in	June 10th	Mar 1st Samples finished	R Fin.	R39		Good Condition
Feb 8th	S. Crompton Co.	776	890	100	6500	1625	39in	Sept. 1st		To Bolt			Sub Sample
Feb 8th	J. Bleach & Sons	995	991	2000	130000	27368	40in	½ Aug. 30 ½ Sept. 30	Apr 3rd	M Fin	M37		1 Bl damaged
Feb. 9th	Peterjones Co.	639	892	100	9000	1950	40	July 1st	Mar 25th	C Fin	C36		Blackall
Feb 9th	J. Smith & Sons	719	893	2000	130000	26000	39in	10000 yds July 1st & balance all	Mar 2nd	K Fin	K36	120000 yds	Narrow Fin
Feb 9th	P. Mabert Co.	1875	894	200	2496	13000	39	June 30th	Mar 2nd	R Fin	R36		Blackall

FIG. I.

I will describe has been in use for many years, but it is always possible to improve on any system after it is adopted. It has been found to give good results in a plant having a small output, and also in a plant producing 200,000 pounds per week.

The starting point in a bleachery is the grey room. Here is kept the receiving book, or grey book as it is sometimes called, and

which is shown at Fig. 1. This book has a large leaf and looks rather complicated, but when the goods are entered, checked or cancelled in the proper manner, the form is very simple. It is a combination of three books, a complete record of all goods received, a record of all goods put in work, and showing at the same time the amount of goods in stock. When the goods are put in work finishing, the packer knows what is coming through for folding and packing, and the office has a record of all that is in process. This bleachery record is shown at Fig. 2.

As the kiers are put in work for the whole period, the office has the record, which is summarized to get the actual production of the whole plant, the records of the total amount shipped to find the exact cost of

Bleachery Record

Date	Pieces	Pounds	Yards	Grey Width	Fin Width	Grey Yds. Per H.	White Yds Per H.	Style	Name Of Firm	Date to be Shipped	Kiln No.	Remarks
Mar 2nd	629	7.556	37.780	39½	36½	5.90	5.27	R 27	J. & B. Levy	June 10th	(a)	
Mar 2nd	100	1.750	7.000	40½	36	4.82	4.32	C 36	P. Jones & Co.	July 1st		
"	154	2.002	10.010	39½	36	5.50	5.25	K 36	J. Smith & Co.	"	(a2)	
"	200	2.476	13.000	39	36	5.35	5.10	R 36	P. Mahon & Co.	June 30th		
	454	6228	30.010									

FIG. 2.

they are checked, as shown in Fig. 1, and then entered into the bleachery record. This book is used in triplicate form, two leaves being perforated so that they can be detached, one leaf being given to the bleacher, who signs and dates it when he washes up the goods, and then passes it on to the starcher or finisher. The finisher signs and dates it also and passes it to the folding room where it is filed. One copy is kept in the grey room and one is sent to the office. With this method the bleacher knows what he has to handle in the bleachery, the starcher knows what is coming through for production being taken from the packing room records. The two books, as shown, are all that are required for the receiving and putting out of the work in the bleachery. If a departmental cost is required, it will be necessary to have slips printed for each department. These can be printed as shown at Fig. 3. These forms are distributed to the workmen who are in charge of the machines, each man making a record of his day's work on these slips, taking it from the bleachery record. These are collected each morning by the foreman, checked and initialed, and then taken to the office. With

these forms or slips the superintendent can easily check each day's work of every man in the place. If a man has not done enough work the superintendent can draw the former's attention to the fact. If the plant is

Name John Williams

Machine 7 Bowl Mangle Time 7 to 6

Date Mar 16th/10

Pieces	Pounds	Yards	Finish	Remarks
100	1.750	7.000	C Fin	Chaud 3 rubs
200	2.476	13.000	R Fin	all rubs for Cards off

FIG. 3.

not doing piece work, these slips are a check on the timekeeper and also in finding where any delay has occurred in handling the goods. At the end of the period they are summarized, thus showing the production of each department, as well as being a record of all the runs given to the different lines and finishes through the bleachery.

The next thing to determine is the cost of production. There are the fixed charges, the drugs and chemicals, materials and supplies, salaries and wages paid to the employes. The materials used in the bleaching department comprise soda ash, caustic, chlorine, soap, sulphuric acid, etc. The bleacher has a blank book with every other leaf perforated. These he fills out with the orders for what he requires, as shown at Fig. 4. He tears off the copy at the perforation and sends it to the storeman, who in turn sends him what he has ordered and enters it into his department cost book, which he keeps in a separate form for the

Barton Bleaching Co

Starching Dept To Stores

Date March 10th/10

Kindly send to above dept

15 Bags of Starch

5 " " Farina

3 " " Chalk

2 " " Wheat Starch

1 Barrel of China Clay

John Pollock Foreman

FIG. 4.

Barton Bleaching Co

Bleaching Dept To Storeman

Date Mar 10th/10

Kindly supply

2 Bags of Soda Ash

2 Barrels of Chlorine

1 Load of Sulphuric Acid

John Barlow

Bleacher

FIG. 5.

Barton Bleaching Co

Contents

Date	Package No.	Weight	No. of Pieces	Yards of Pieces						Total Yards	Style	Firm	Date Shipped
June 1st/10	1934	246½	20	63	66	64½	66	64½	65	1,300	R37	J. H. Blair & Co.	June 10th/10
				65	65	66	64½	65	66				
				65	64	66	65	64½	65				
				65	65								

FIG. 6.

supplies used by each department. Each foreman has an order book on which he enters the materials that he requires, sending the original order to the storeman, who storeman checks and enters it against the starching department. At the end of each period the storeman takes his books into the office, the cost clerk checks off the quan-

Barton Bleaching Co.

Cost Sheet — Period Ending March 31st/10

Fixed Charges	Insurance to end of Period			102	75		
	Head Office charges + Lease			205	50		
						308	25
	Coal consumed during Period			400	00		
	Water " " "			95	50		
	Power " " "			150	75	646	25
Salaries	Office employees			350	00		
	Postage + stationery			20	50		
	Incidental expenses			15	75		
Packing Room						386	25
	Manila packing Paper			24	75		
	" Cases			88	50		
	Twine + Cord			15	25		
	Crayons + Tape			1	25		
	Sundry supplies + oil			10	50		
	Employees Wages			350	75		
Starch + Calendar Dept.						488	00
7000 lbs	Starch	@	3¢ per lb.	210	00		
3000 lbs	Farina	@	3½¢ " "	97	50		
2000 lbs	French Chalk	@	2½¢ " "	200	00		
10,000 lbs	China Clay	@	1¢ " "	100	00		
10 gals	Shading Blue	@	2.35 per gal	22	50		
25 lbs	Parraffin Wax	@	14¢ per lb	3	50		
	Oil + Supplies			10	25		
	Employees Wages			415	50		
Bleachery Dept.						1059	25
3000 lbs	Sulphuric Acid	@	1.35 per 100 lbs	40	50		
5000 lbs	Chemic Powder	@	1¼¢ per lb	62	50		
4000 lbs	Soda Ash	@	3¢ " "	120	00		
3000 lbs	Bleaching Soap	@	4¢ " "	120	00		
	Oil + Supplies			15	10		
	Employees Wages			225	20		
						583	30
	Total Expenditure period ending March 31/10					$3471	30
	John Smith Cashier						

FIG. 7.

files it for future reference, the foreman keeping the duplicate. The boss starcher follows the same practice as the bleacher, his order form being shown at Fig. 5. The tities used in each department, deducts the amount from his stock, extends prices and works out the cost for each period for materials and supplies for each department.

Next come the methods of finding the production, of giving out supplies and materials and of finding and placing the cost of the same. There are other supplies such as oil for the machinery, tickets and labels, cord and twine, paper, etc., for the packing and folding room which have to be recorded. These are included on the forms illustrated, but are not shown in detail. The system so far as explained will not show the exact cost of the goods produced, as some of the goods may have to lie in stock over the end of the period and not show any receipts for shipment. This forces us to take the exact quantity of goods shipped to form a basis for the cost of production for each period so that one period balances with another in respect to taking goods out of stock. To find the quantity of goods shipped, forms as shown at Fig. 6 are used. These are used in triplicate, one copy being sent with the package to the customer, one copy to the office and one copy is kept in the packing room for reference when shipping. When these forms are properly filled in and checked, they should give an exact account of the contents of each case or package. At the end of the period the quantity of goods shipped, with the extensions carried out, should give the receipts for the period. These are incidental receipts, such as for rags, waste paper, empty barrels, etc., all of which are recorded and entered under the receipts for the period. When these have all been summarized, the sales of goods shipped, after deducting the goods left in stock, will give the total receipts for the period. Against this is placed the expense account, which should produce a record like that shown at Fig. 7. The details are rather brief, but it gives the system of the departmental cost finding as well as the cost finding of the whole plant. When the receipts and expenses are complete they should show the profit and loss account.

If this system is carried out in a business-like manner and everything carefully checked it does not take long to get conversant with the whole system. Let us suppose the goods shipped amounted to 105,975 pounds, and the expense as per cost sheet, $3,471.30. This would give an average cost of 3.275 cents per pound on the production of the whole plant. Let us suppose the cost per pound of a single department, bleaching for illustration, is wanted. The same weight of goods has come through this department so the cost is based on expenses as per cost account, $583.30. This would be equal to $.0055 per pound for the bleaching department. The same rule applies to the other departments as regards the departmental cost.

If it is desired to find the cost of any particular line of cloth, all that is necessary is to keep track of the goods on the machine slips, finding out the number of times they are run on the different machines, and keeping the mixings for the particular line separate so that the exact amount of starch, etc., used will be known. When the particular line is finished the average cost for labor and expense is determined. The system may seem rather complicated, but when worked systematically it soon becomes a simple matter of daily routine.

"BEMBERGIZED" WOOL

Attention was called in our March issue to the process of treating wool, to impart a luster to the fiber. It is the invention of Dr. Emil Elsaesser of Langerfeld, Germany, and is controlled by the J. P. Bemberg, Aktien Gesellschaft, Barmen-Ritterhausen, the American agent being Alfred Suter, Fifth Avenue Bldg., New York. Wool treated by this method is called "bembergized" wool, from the name of the German firm. The process is protected by patent in this country and abroad, and is described by the inventor as follows: The object of the invention is to improve wool by increasing its gloss without affecting its solidity. To this end, the wool is heated with so strong a bisulfate solution that the wool shrinks and assumes a rubber-like condition in which it may be extended to almost double length according to the kind of wool, and fixed in this stretched condition. The product obtained in this way displays a considerably higher gloss and a greater affinity for dyestuffs than the untreated material, while the strength of the

stretched material is greater than that of the unstretched one and sometimes also that of the untreated material.

The concentration of the bisulfite solution necessary for producing this result cannot be limited in degrees, because it depends upon the temperature, the duration of the treatment and the kind of the wool. In each case, the solution should be so strong that the wool tends to shrink and assumes a rubber-like condition. Instead of stretching the material after shrinkage during the treatment or immediately thereafter, the material can also be kept stretched to prevent shrinkage. The fixing of the stretched wool fiber may be effected in various ways, for example by prolonged boiling in water preferably with the addition of a smaller percentage of sulphuric acid, or by the action of baths, containing substances which decompose or combine with the bisulfite, such as chlorin, metallic salts like alumina salts, basic bodies, formaldehyde and the like, or by damping or steaming or by drying and decomposition of the bisulfits by means of gaseous substances with subsequent damping and steaming, or by cooling or cold washing. Instead of bisulfite solutions there may be employed double compounds of bisulfite, which split up at higher temperature, such as acetone-bisulfite.

The wool can be used in any desired form, that is as loose wool, wool yarn, fabrics and the like. Other substances such as hair, feathers, and in sufficiently thin form even horn, fish bones and the like, behave similarly to wool in presence of bisulfite.

The process for the production of a heightened gloss and a finer yarn-count is as follows: Wool yarn in the skein is treated by boiling for about five minutes in a solution of sodium bisulfite (one part by volume of bisulfite solution of 40° Baume diluted with five to six parts of water). At the same time the wool is stretched by means of any suitable mechanical arrangement to the desired length. Then in the stretched condition the wool is transferred to a second bath which contains about 2 per cent. of mineral acid and boiled herein for an hour; it is then washed out and dried. Or the boiled and stretched wool is cooled or washed and cooled whereby the shrinkage action of the bisulfite is stopped and the fixing of the wool fiber can now be completed in the loose condition of the wool by the above-mentioned means. The process closely resembles the known mercerization of cotton; all the experiences gained in connection with mercerizing may find appropriate application herein.

[Samples of "bembergized" worsted yarn can be seen at our Boston office.]

BISULPHITE OF SODA FOR SOURING

Editor Textile World Record:

In the bleaching of muslins, we use a weak solution of sulphuric acid to kill any lime left in the cloth. We understand that bisulphite of soda can be used instead to better advantage. Will you please give us any information you have on the use of bisulphite of soda as a substitute for sulphuric acid under the conditions named.

Manix (2000).

The use of bisulphite of soda instead of sulphuric acid for neutralizing traces of lime left in the goods after using chlorine as the bleaching agent, involves a question of cost, rather than practicability. It is not merely the cost of the sulphite per pound, but it is the strength that has to be used that prohibits its general use. There are very few bleacheries using bisulphite of soda for this purpose. It is used more extensively with the peroxide bleach for obtaining a neutral bath for the goods that are bleached with the peroxide method. The price of the chemicals in question do not vary much, but sulphuric acid can be diluted to such an extent as to perform the same amount of work. It leaves the goods a little softer to the feel than sulphuric acid does. It is not generally known among bleachers that the same results can be obtained by the use of sodium hypochlorite as the bleaching agent. This will give a better white, and a softer feel to the goods with very little risk of tendering. This is obtained by mixing chlorine and soda ash. The recipe was published in the August issue of the Textile World Record on pages 582 and 602, one in connection with the bleaching of ramie yarn, and the other for bleaching cotton hosiery yarn. I have used this mixture on piece goods for the past three or

four years with very satisfactory results. The goods came out whiter in the bleach and were much softer after being finished, and the lime stains that often showed on the goods disappeared entirely. If "Manix" will use sodium hypochlorite he will get satisfactory results without having to use bisulphite, and then the sulphuric acid could be used as the neutralizer. Delco.

Dye Recipes

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD RECORD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16-page pamphlet, in convenient form for preservation. Subscription price for the Dyers' Supplement $1.00 per year.

Recipe No. 49

ORANGE ON WORSTED YARN

Orange L R on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Orange L R.
(Geisenheimer & Co., 189 Front St., New York.)
20 lbs. Glauber's Salt.
5 lbs. Sulphuric Acid.

Enter at 140° F., and dye at a boil for one hour.

Orange L R produces a very red shade of orange which is very fast to light. The color is much faster than the ordinary oranges of this shade, is level dyeing, and is fast to milling, sulphur, acid and finishing.

Recipe No. 50

BLUE ON COTTON YARN

Thiogene Cyanine B on 100 lbs. cotton yarn. Prepare the dye bath with

10 lbs. Thiogene Cyanine B.
(H. A. Metz & Co., 122 Hudson St., New York.)
15 lbs. Sodium Sulphide Crystals.
5 lbs. Soda Ash.
30 lbs. Common Salt.

The dyestuff should be dissolved in conjunction with the soda ash and the sodium sulphide crystals, and this solution added to the dye bath which contains the salt. After boiling up, the bath is allowed to cool somewhat, and the material entered and dyed for one hour at a boiling temperature.

Thiogene Cyanine B possesses very good fastness to washing, milling, and acid.

Recipe No. 51

RED ON COTTON YARN

Triazol Fast Red 8 B on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Triazol Fast Red 8 B.
(Geisenheimer & Co., 189 Front St., New York.)
20 lbs. Glauber's Salt.
½ lb. Soda Ash.

Enter at 160° F., and dye at a boil for one hour.

Triazol Fast Red 8 B produces very blue shades of red which possess excellent fastness to acid. It is extensively used in silk and cotton dyeing and for mercerized cotton goods. It is easily soluble, and dyes level. As it does not exhaust very well, double the quantity of Glauber's salt should be used in the dye bath.

Recipe No. 52

BLUE BLACK ON WORSTED YARN

Meta Chrome Blue Black 2 B on 100 lbs. worsted yarn. Prepare the dye bath with

5 lbs. Meta Chrome Blue Black 2 B.
(Berlin Aniline Works, 213 Water St., New York.
20 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

Enter at 140° F., raise slowly to a boil and boil for 3/4 of an hour, then add

1½ lbs. Sulphuric Acid,

well diluted, and boil 3/4 of an hour longer. Finally add

1½ lbs. Potassium Bichromate

to the same bath, and continue the boiling for 3/4 of an hour.

Meta Chrome Blue Black 2 B possesses exceptionally good fastness to light, and its fastness in other respects is also good.

Recipe No. 53

BLACK ON COTTON YARN

Columbia Fast Black R Extra on 100 lbs. cotton yarn. Prepare the dye bath with

4 lbs. Columbia Fast Black R Extra.
(Berlin Aniline Works, 213 Water St., New York.)
20 lbs. Glauber's Salt.
2 lbs.Soda Ash.

Enter at 180° F., and dye at a boil for one hour.

Then rinse, and couple with diazotized para nitroaniline in a bath made up with

1½ lbs. Para Nitroaniline.
4 lbs. Hydrochloric Acid, 32° Tw.
1½ gals. Water (boiling).

When the neutralization of the Paranitroaniline with hydrochloric acid is complete, add

4 gals. Cold Water.

When perfectly cool add

1¼ lbs. Sodium Nitrite

which has been dissolved in

1 gal. Cold Water.

Then make the whole bath up to volume necessary for convenient working of the material. After working in this bath for 1/2 hour, rinse thoroughly, and dry.

Columbia Fast Black R Extra when dyed and coupled in this manner, will be found to possess very good fastness.

Recipe No. 54

YELLOW ON COTTON YARN

Thio Indigo Yellow Paste on 100 lbs. cotton yarn. Prepare the dye bath with

40 lbs. Thio Indigo Yellow Paste,
(Kalle & Co., 530 Canal St., New York.)

mixed with ten times its volume of water (hot). To this is then added

20 lbs. Caustic Soda,

which has been previously dissolved in water.

16 lbs. Hydrosulphite Conc. Powder

is then slowly stirred into the mixture, which is then allowed to stand until reduction is complete, this being indicated when the mixture becomes clear and of a dull red color.

The material is then dyed in this bath at ordinary temperature for 1/2 hour. Then wash and finish by boiling in a soap bath.

Thio Indigo Fellow Paste possesses very good fastness to washing.

Recipe No. 55

BLUE ON COTTON YARN

Sulfamine Blue D on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Sulfamine Blue D.
(F. E. Atteaux & Co., 174 Federal St., Boston, Mass.)
20 lbs. Glauber's Salt.

Enter at 120° F., raise to a boil and dye at a boil for one hour to one and one-half hours. Then wash.

Sulfamine Blue D is very fast to light and milling and suitable for the dyeing of navy blue shades on ladies' and men's wear.

These colors can also be dyed on a chrome mordant or by the chromate process. They exhaust well in a neutral bath and can be used for shading wool in union goods.

Recipe No. 56

BROWN ON COTTON YARN

Direct Brown G O on 100 lbs. cotton yarn. Prepare the dye bath with

2 lbs. Direct Brown G O.
(Innis Speiden & Co., 46 Cliff St., New York.)
20 lbs. Common Salt.

Enter at 160° F., and dye at a boil for one hour.

Direct Brown G O will be found to possess the characteristic properties of the direct cotton colors.

Recipe No. 57

SCARLET ON COTTON YARN

Diamine Azo Scarlet 8 B Extra on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Diamine Azo Scarlet 8 B Extra.
(Cassella Color Co., 182 Front St., New York.)
20 lbs. Glauber's Salt.

Enter at 160° F., and dye at a boil for one hour. Then rinse, and diazotize in a cold bath made up with

2½ lbs. Sodium Nitrite.
7½ lbs. Hydrochloric Acid, 32° Tw.

Then rinse in cold water and develop in a bath made up with

1¼ lbs. Beta Naphthol

dissolved in

1 lb. Caustic Soda Solution, 77° Tw.

Diamine Azo Scarlet 8 B Extra possesses high coloring power, giving a red of a blue cast which possesses very good fastness to washing.

Recipe No. 58

BLUE ON WORSTED YARN

Lanacyl Blue R N on 100 lbs. worsted yarn. Prepare the dve bath with

3 lbs. Lanacyl Blue R N.
(Cassella Color Co., 182 Front St., New York.)
20 lbs. Glauber's Salt.
7 lbs. Acetic Acid.

Enter at 120° F., raise slowly to a boil and dye at a boil for one hour. If necessary, add more acetic acid or a little sulphuric acid towards the end to exhaust the color.

Lanacyl Blue R N possesses excellent fastness to light, alkali, carbonizing, and very good fastness to washing.

Recipe No. 59

ORANGE ON WORSTED YARN

Wool Fast Orange G on 100 lbs. worsted yarn. Prepare the dye bath with

3 lbs. Wool Fast Orange G.
(Badische Co., 86 Federal St., Boston, Mass.)
20 lbs. Glauber's Salt.
3-5 lbs. Sulphuric Acid.

Enter at 140° F., and dye at a boil for one hour.

Wool Fast Orange G possesses very good fastness to light and also has good fastness to washing and milling.

Recipe No. 60

GREEN ON COTTON YARN

Para Green S on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Para Green S.
(Farbenfabriken Co., 117 Hudson St., New York.)
30 lbs. Common Salt.
½ lb. Soda Ash.

Enter at 180° F., and dye at a boil for one hour. Then rinse, and couple in a bath made up with diazotized paranitroaniline as follows:

1½ lbs. Para Nitroaniline.
4 lbs. Hydrochloric Acid, 32° Tw.
1½ gals. Boiling Water.

When the neutralization of the para nitroaniline with hydrochloric acid is complete, add

4 gals. Cold Water.

When perfectly cool, add

1¼lbs. Sodium Nitrite

which has previously been dissolved in one gallon of cold water.

Then make the whole bath up to the volume necessary for the convenient working of the material, and work in this bath for 1/2 hour. Rinse thoroughly, and dry.

Para Green S possesses very good fastness to washing and will be found of general use in cotton dyeing and also in cotton printing, and it may be discharged perfectly white with the proper hydrosulphites.

Recipe No. 61

BLUE ON WORSTED PIECE GOODS

Dark Blue on 100 lbs. worsted piece goods. Prepare the dye bath with

2 lbs. Amazo Navy Blue B.
(American Dyewood Co., 84 William St., New York.)
1 lb. Amazo Violet 4 B O.
2 lbs. Amazo Brilliant Red 6 B.
3 lbs. Oil of Vitriol.
20 lbs. Glauber's Salt.

Enter lukewarm and bring to a boil. Boil one hour. Rinse.

Recipe No. 62

ORANGE ON WORSTED PIECE GOODS

Orange on 100 lbs. worsted piece goods. Prepare the dye bath with

1 lb. 8 oz. Amazo Orange Crystals.
1-1/20 oz. Amazo Brilliant Red 8 B.
(American Dyewood Co., 84 William St., New York.)
3 lbs. Oil Vitriol.
20lbs. Glauber's Salt.

Enter goods lukewarm and bring to a boil in 20 minutes. Boil one hour and rinse.

The above colors are very level dyeing and especially adapted to the dyeing of woolen and worsted goods as they are of very good fastness to light and fulling.

Recipe No. 63

VIOLET ON WORSTED PIECE GOODS

Violet on 100 lbs. worsted piece goods. Prepare the dye bath with

2 lbs. 3½ ozs. Amazo Violet 5 B.
(American Dyewood Co., 84 William St., New York.)
12 ozs. Amazo Violet 4 R.
3 lbs. Oil of Vitriol.
20 lbs. Glauber's Salt.

Enter lukewarm and bring to a boil. Boil one hour. Rinse.

Recipe No. 64

BLUE ON COTTON YARN

Sulfamine Blue 2 R on 100 lbs. cotton yarn. Prepare the dye bath with

3 lbs. Sulfamine Blue 2 R.
(F. E. Atteaux & Co., 174 Purchase St., Boston, Mass.)
20 lbs. Glauber's Salt.

Enter at 120° F., raise to a boil and dye at a boil for one hour to one and one-half hours. Then wash.

Sulfamine Blue 2 R is very fast to light and milling and suitable for the dyeing of navy blue shades on ladies' and men's wear.

These colors can also be dyed on a chrome mordant or by the chromate process. They exhaust well in a neutral bath and can be used for shading wool in union goods.

New Machinery and Processes

This department is designed to present from month to month a brief mention of new machinery, devices and processes being brought out in this country and abroad, that are of interest to the textile manufacturers. It is not a list of patents but of improvements on the market, the idea being to present to our readers a systematic monthly record of new machinery, etc., of interest to textile mill men.

Whenever possible we endeavor to make a personal investigation of the new machinery and processes described in this department. In the absence of such personal investigation we must necessarily rely upon information obtained from those who control the machines and processes.

We invite machine builders and others to send us such information for this department.

Pattern Cutting Machine. The William Firth Company, 200 Devonshire St., Boston, are American Agents for the Hardaker Pattern Cutting Machine, mentioned in our March issue. This machine will handle cloth up to 33 inches in width, and is capable of a large production with economy of material.

Cutting Machine for Knit Goods. The Eastman Machine Co., Washington and Goodell Sts., Buffalo, N. Y., have recently placed on the market improved models of their reciprocating and rotary cutters for underwear and union suits. A description of these machines will be found in another part of this issue.

Can Tramway for Cotton Mills. William Firth, 200 Devonshire St., Boston, Mass. A system of can tramways for transporting roving cans from one part of the mill to another. A description appears in this issue.

Spindle Bearing. F. A. Sattler, Pleisse, Germany. A yielding collar for mule spindles which is said to prolong the life of the spindle and result in keeping them in position.

Matting Loom. F. Guertler, Zittau, Germany. A loom for weaving matting and similar fabrics made with wood strips.

Stop Motion. Bernhard Elmendorf, Isselhorst, Germany. An improved filling stop motion for looms.

Cleaner for Ring Frames. Richard Korff, Vienna, Austria. An improved device for cleaning the ring frame tables. It can be operated either by an endless plate or by hand.

Bobbin Cleaner. Robert Weigel, Reutlingen, Germany. A machine for removing yarn from bobbins, thus obviating the objectionable cutting of the yarn which often injures the bobbin.

Clothing Printing Machine. Anton Svoboda, Reichenberg, Bohemia, Austria. An improved machine for printing fabrics on a plate press.

Bleaching Process. Fr. Gebauer, Berlin, Germany. A process of bleaching vegetable fibers which is adapted for cloth, yarn or raw stock.

Cloth Shear. J. Simonett, Bradford, England. A triple cloth shear having three cutters. It is claimed that most fabrics can be sheared by one passage through this machine.

Self-Threading Shuttle. J. Duerden, 69 Bankfield Terrace, Bury, England. An improved self-threading shuttle which, it is stated, is easily manipulated and will not become unthreaded during weaving.

Stripping Roller for Cards. Dronsfield Bros. & Co., Oldham, England, have recently placed on the market a light type of stripping roller weighing between 20 and 30 pounds, which enables a cover to be attached without exceeding the weight limit fixed by the English regulations.

Spinning Frame. Walter M'Gee & Son, Ltd., Paisley, Scotland. A spinning frame in which the ring is driven, this being an attempt to combine the advantages of the ring and flyer frames.

CAN TRAMWAY FOR COTTON MILLS

The illustrations show a system which has been in use for two years in two large cotton mills in this country where it has demonstrated beyond question its value in transporting roving cans from one part of the mill to another and in placing and removing cans in relation to the various processes and machines such as cards, lapers, combers and drawing frames. It is now offered to the cotton mill trade by William Firth, 200 Devonshire St., Boston, who controls and instals the tramway. In consists of a continuous track of steel plates set into the floor of the mill and provided with guides in which the bottom of the cans slide easily. When installing the tramway the top flooring is cut away with sufficient width to accommodate the track, the sides of which are set flush with the top of the floor, the bottom of each being about one-half inch below the surface. As shown at Fig. 1 the pusher is provided for moving the cans on the tramway. It has a wooden arrangement which partially encircles the can at its base and is adapted to run on casters. A small number of cans can be moved easily without the pusher, but where a large number of full cans is to be transported a considerable distance the pusher is more convenient and, as it is very inexpensive, several may be kept on hand in convenient locations.

The tramway is installed with main tracks in the alleys between the cards and drawing frames and auxiliary branch tracks extending up to the rear of the frames. In doffing from the cards the full cans are slid into the tramway from the card coiler and pushed along into position behind the first process drawing frames. The drawing frame hand sets the cans in place in the branch tracks with the full cans always farthest from the frames. The can nearest the drawing frame becomes empty first and the end from the next full can is carried forward to take the place of the end just run out. In this way the supply in the series of cans becomes automatically graduated in relation to the distance between the cans and the frame. The cans are always arranged in order, with the one having the least material nearest the frame and the supply in the other cans ranging up like a flight of steps. The more the supply is reduced in each can the nearer it is

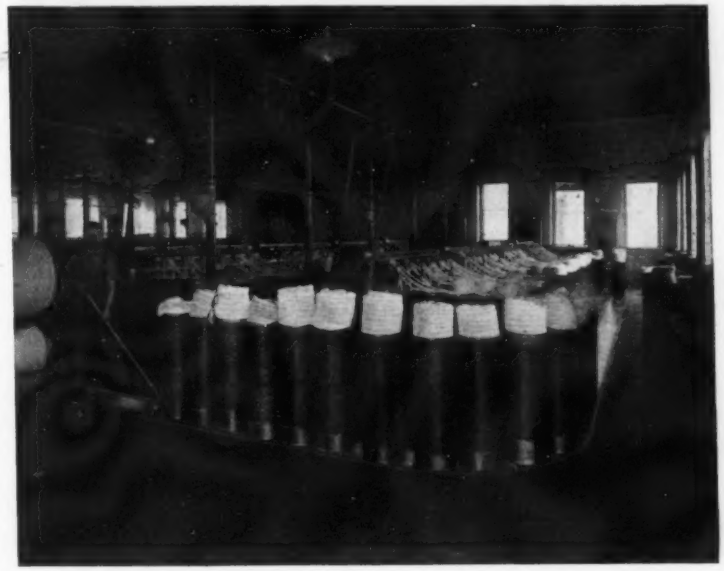


FIG. 1. SHOWING THE PUSHER FOR MOVING THE CANS ON THE TRAMWAY.

moved to the frame so that the sliver draws out more readily, and practically one hundred per cent. goes through the rolls, leaving no waste.

Fig. 2 shows the tramway running around a card alley. Fig. 3 shows the cans as they are moved in the tramway without jaring the top layers.

The advantages claimed for the tramway are summarized as follows: Twenty-five per cent. saving in help in doffing from cards: Where formerly four coiler boys were required for doffing from cards, three can easily do the work with the can tramway in much less time. A smaller boy can handle the cans as there is no lifting, and more full cans can be moved at one time. Twenty or more empty cans can be easily returned from the drawing frames in one trip.

Twenty-five per cent. saving in drawing frame hands: Where formerly four drawing frame hands were employed with their time fully occupied, three hands can do the same work with the can tramway, because the empty cans are easily removed and the supply for the full cans quickly pieced up, all practically in one motion. After the empty can is removed and the end pieced up all six cans are pushed forward together. It is not necessary to look over all the cans to see which one has run out, for it will always be the can nearest the drawing frame.

Ninety per cent. saving in waste: The can tramway provides for feeding the cans to the drawing frame in proper order according to amount of material in the individual cans. As the supply in each can is reduced the can is fed forward nearer to the frame, thereby facilitating its delivery so that waste from this source is practically eliminated. It prevents upsetting of cans and spilling and soiling their contents. It also guards against disarranging the sliver on top of cans.

Eliminates the use of trucks and saves time and labor: The can tramway makes it possible to transport a large number of cans at one time and provides for guiding them through narrow spaces and around curves where a truck could not pass. It saves lifting cans and lightens all the labor of transporting and placing them. Where the cans were moved by the old method of pushing three or four along the floor, a boy can now

FIG. 2. SHOWING THE TRAMWAY RUNNING ALONG A CARD ALLEY.

do a man's work and move more cans in one trip.

Prevents accidents to machinery: The can tramway prevents breaking or damaging expensive machinery, which so often occurs from the careless handling of heavy trucks. Frequently through negligence a truck is run against some protruding part of a card or other machine and a portion will be broken off. Besides the cost of repairs such an accident often means the loss of the use of the machine for a considerable period and entails expense in this way. Also, when a truck happens to bump against a card the top of an overfull can sometimes fall over into the doffer and is liable to jam the wire or otherwise injure the mechanism.

Prevents damage to cans and wear on floor: The can tramway prevents wear and tear on the cans. The tramway forms a permanent part of the floor and is practically indestructible. It saves wear and splintering and removes the necessity of frequent relaying of top flooring.

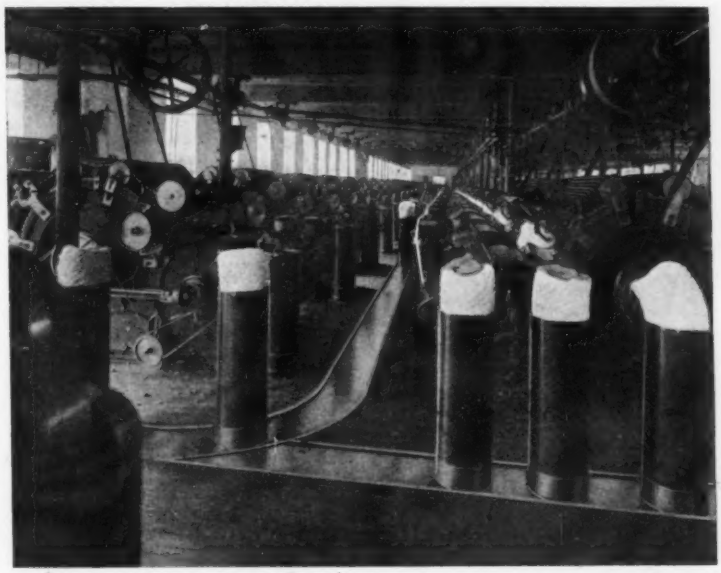


FIG. 3. SHOWING THE CANS AS THEY ARE MOVED IN THE TRAMWAY.

The exports of silk and silk manufactures from Switzerland during 1911 was valued at $25,131,381 as compared with $26,743,743 during 1910.

TRADEMARKING, MEASURING AND WINDING CLOTH

The illustration shows the Model P2 winder built by the Parks & Woolson Machine Company, Springfield, Vt. In the last issue we published a description of the P1 Model. Both of these models are built on the same general plan. The winding mechanism is driven by machine cut sprockets and high speed chain. They run noiselessly and give large production with little wear. The speed is readily maintained at 100 yards per minute, and under favorable conditions double that speed can be obtained as far as the machine itself is concerned. One of the special features of the Model P2 winder is an automatic yardnumbering device by which each yard is clearly stamped with its serial number beginning with the inside end and counting outward. The fractions are also included thus, 1, 1/4, 1/2, 3/4, 2, 1/4, 1/2 and so forth. When a trademark die is used it takes the place of the 1/2 yard stamp.

Each yard shows exactly 36 inches between marks and the very common complaint of short cloth is eliminated when the cloth is yardnumbered. The end mark is used as a check to the dial measurement and accuracy in recording ensured. Middlemen

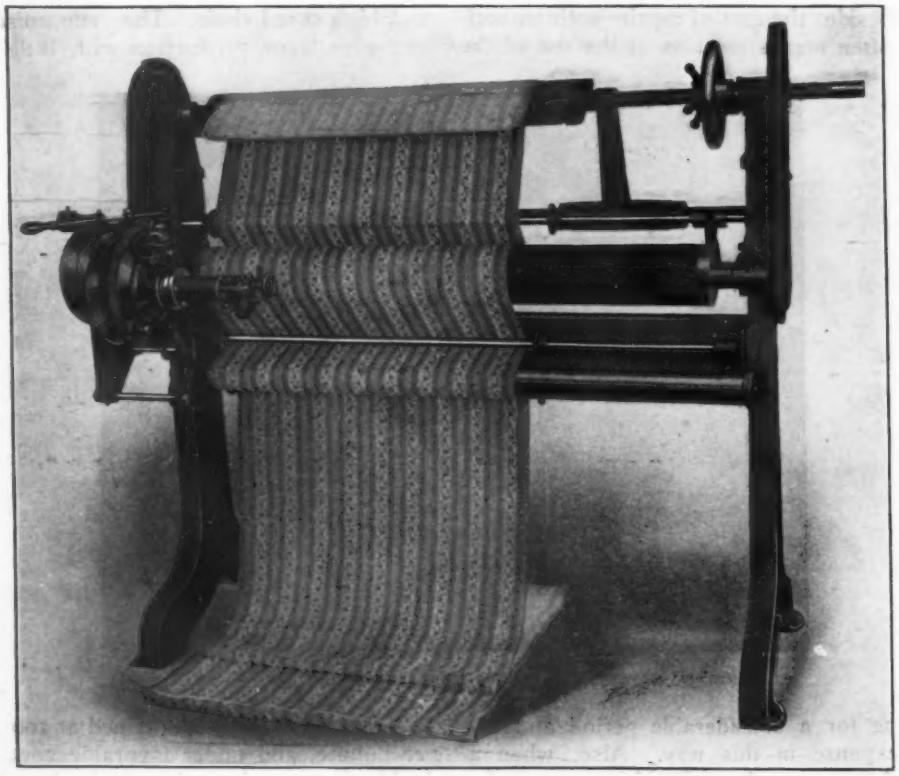
like yardnumbered cloth as it saves inventory remeasuring and promotes economy in cutting up.

When it is desired to package certain yardages at a time and not whole cuts, an adjustable stop is put on the dial. This is set at the required yardage and the machine automatically stops when that amount is wound in. The cutting off point is conveniently located near the board so there is no rethreading to start the next piece. This is done through the medium of an automatic shipper and brake.

When entire pieces are packaged each time, an automatic dial lock acts when the tail end of the cloth leaves the measuring drum to prevent overrunning.

A supporting arm on the right hand or adjusting jaw shaft enables a great range in cloth widths to be handled in the same machine without undue overhang to the jaw shaft.

This machine is also fitted with an oscillating compression roll that compresses the cloth as it is wound on the board. This is capable of winding broad goods in the open width on a slender board and make a smooth roll free from wrinkles and of extreme hardness. It does this without stretching the goods.



PARKS & WOOLSON WINDER (MODEL P-2) FOR RAPID TRADEMARKING AND MEASURING OF CLOTH.

A great variety of winding accessories are available for this machine. One of these is an expanding keyed mandrel for holding small diameter cardboard tubes that cannot project beyond the cloth edges after winding.

The manufacturers have many photographs of modifications of this machine and adapt it to most any packaging conditions.

A PATENT HOT AIR BACKWASHER

In order to meet the demand for a more satisfactory system of drying carded and prepared sliver than by steam cylinders, Taylor, Wordsworth & Co., the well known builders of worsted machinery, of Leeds, England, have brought out a backwasher, shown at Fig. 1, on which the sliver is treated by hot air. This does away with the objectionable contact with steam cylinders which frequently scorched the fiber before the inside of the sliver is even heated. Edward Jefferson & Brother, 117 S. Second St., Philadelphia, Pa., are the American agents for this improved machine. The sliver is dried without danger of scorching and much more rapidly than is possible on a steam cylinder. Among the claims made for this hot air backwasher are the following: No steam cylinders to burst or get out of order; no stuffing boxes or glands to leak; more uniform drying and absence of scorching; when the machine is stopped with the slivers around the cylinders, they rapidly cool and thus prevent damage to the fiber; an increase of at least 30 per cent. in production; economy of steam; improved condition of the fiber, giving a better spinning sliver; when changing suds the sliver can remain on the cylinder, as no scorching or discoloring can take place.

Two thousand cylinders of this type on backwashers are successfully working on fine, medium and long wools, nearly five hundred being in operation in the United States. This backwasher is built in two forms, horizontal as shown at Fig. 1, or upright, the later being used in order to economize floor space. Fig. 2 shows the gill box which is used in connection with either the horizontal or upright backwasher.

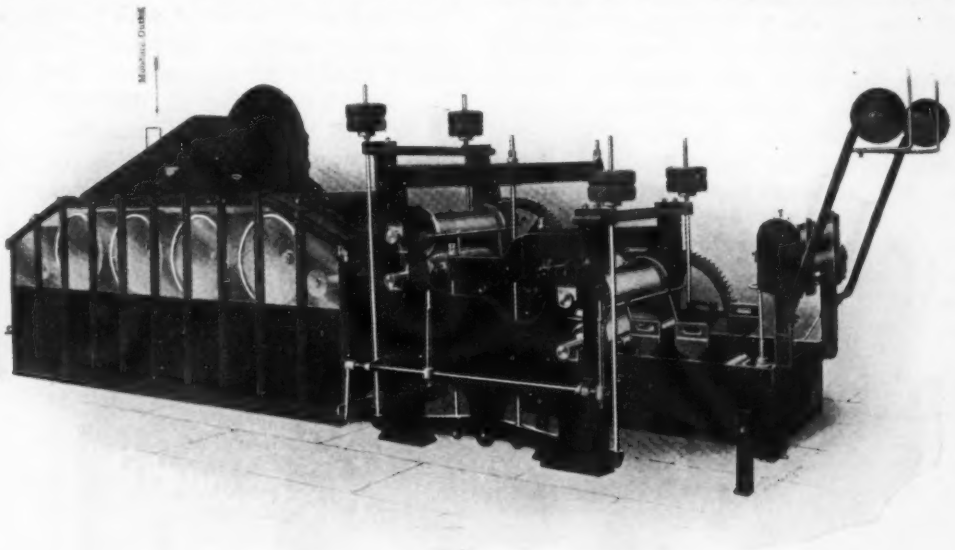


FIG. 1

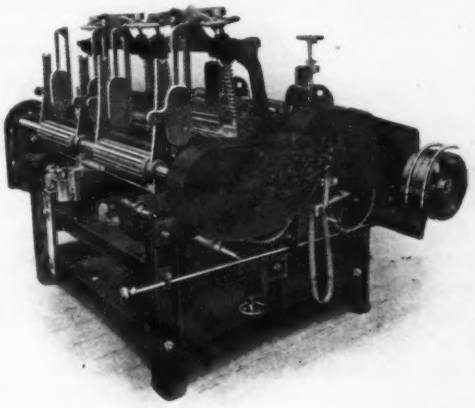
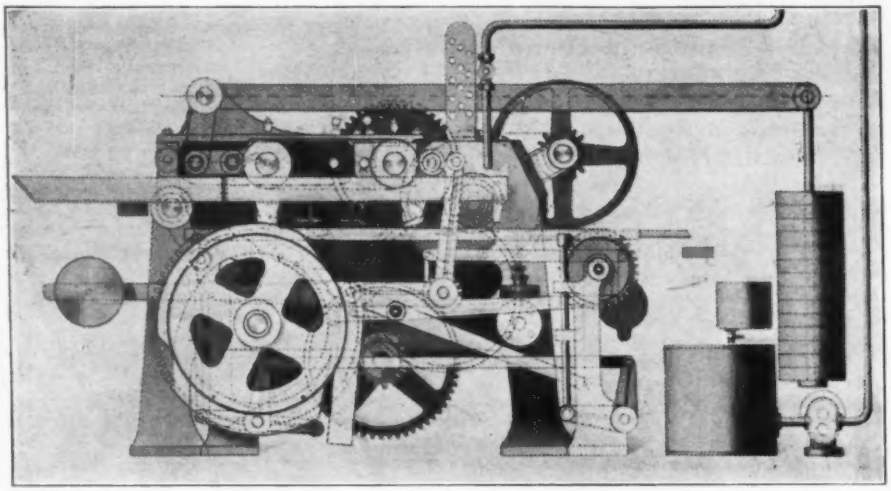


FIG 2.

THE HAHN AUTOMATIC MERCERIZING MACHINE

An important improvement in mercerizing skein yarn has been recently developed by the Niederlahnsteiner Maschinenfabrik. This process, which is protected by patents both in this country and abroad, consists in the handling of the yarn during the mercerizing process. By this new process the yarn is first stretched on the rollers and then passed through the lye. While this is being done the yarn is automatically opened up and straightened on the roller so as to effect a perfect saturation. After this first run through the liquor in a stretched condition the tension is relieved and the yarn passed in a slack condition through the liquor a second time. This enables the liquor to penetrate all parts of the yarn, ensuring a far better and more uniform luster, which is of special advantage in the subsequent dyeing of delicate colors.



THE HAHN MERCERIZING MACHINE

The illustration shows the latest model of the mercerizing machine used for this improved process. It is built by the Niederlahnsteiner Maschinenfabrik, Niederlahnstein on the Rhine, Germany, and L. H. A. Schwartz & Co., 40 Central St., Boston, Mass., are the American agents. The process is in extensive use in Europe, fifty-three machines being now operated by one concern and thirty-two by another in Germany. The results of this new process have been so satisfactory that Messrs. Schwartz & Co. have resumed the agency for this machine. The machine is provided with two pairs of rollers. On each side there are two smooth rollers fixed in strong wrought steel axles. The first roller is fixed, the other being a tension roller, is movable. The shorter arm of the movable lever, which is connected with the flexible pair of rollers, acts on the tension roller in such a way that it can be made to approach the fixed roller or separated from it. The shorter arm is connected with an eccentric which automatically brings the rollers together or separates them. The longer arm of the lever has, at its end, a movable weight which enables the tension to be adjusted as required. When the machine is put in motion the movable roller approaches the fixed roller and the workman has only to place the yarn on both the pairs of rollers and it is then automatically extended. Two basins are placed on rails behind each other. One filled with lye moves automatically under the yarn and is raised high enough for the skein to rotate in the lye to half its length. When the yarn is thoroughly impregnated, the basin sinks and

a thick india rubber roller presses out the superfluous lye which drops back into the lye basin. The lye basin moves back and the second basin intended to receive the washing fluid comes under the yarn. The yarn is thoroughly rinsed by means of a strong syringe, again pressed and loosened—the cylinders again approaching—and then removed by the workman.

The principal advantages of the machine are as follows: The operation is automatic, the result in no way depending on the attention or skill of the workman; the latter has only to put on and to take off the yarn. Irregularity in the tension or treatment of the yarn is impossible and therefore the best result in quality and uniformity is assured. The breaking of the yarn is avoided as the tension is applied gradually and is adapted to the yarn on the machine.

Skeins of any length can be mercerized. The consumption of lye is exceedingly small as the surplus is pressed out and runs back into the lye basin. The machine is provided with an automatic contrivance by which the first part of the washing fluid containing a great quantity of lye is saved, and used for boiling or bleaching purposes, or the lye in it can be extracted by evaporation. In this way the lye consumption, which in any case is less than with other machines, is still further reduced.

The action of the lye is very intense as half the length of the skein turns in the liquor and the india rubber roller helps to work it in during impregnation. The rinsing is very thorough by reason of a syringe and the goods leave the machine quite free from lye.

The yarn is first stretched out of the lye then in this condition passed through the lye while the roller is turning. The yarn is then slackened in order to effect more shrinkage and better penetration of the lye. After sufficient shrinkage of the lye the yarn is stretched again to the original length. This treatment not only insures a far better gloss, but has also a gloss of greater uniformity. Various methods have heretofore been adopted. The yarn was run slack into the lye, then stretched, or it was impregnated in a slack condition. Both processes may be sufficient for average results, but a difficulty sometimes arises. Experts have tried in vain to find a way to treat the yarn so as to get perfect results.

By immersing the yarn while it is under tension the impregnation is more uniform. Then the yarn is slackened by bringing two rollers closer together, the object of this is to allow a certain shrinkage. In every skein there are certain threads longer than others as it is impossible to reel the yarn with the turns exactly equal in length. Thus a part of the yarn gets into the lye in a slack condition and does not shrink to the same extent as the tight threads do. It is not possible to adjust the tension to suit the different lengths. By impregnating the entire skein while it is under tension and thus running it slack through the lye, each thread is allowed to shrink uniformly. After having obtained this uniform shrinkage the tension is again applied and the yarn given another full turn in the liquor. In this way a high and more uniform luster is obtained.

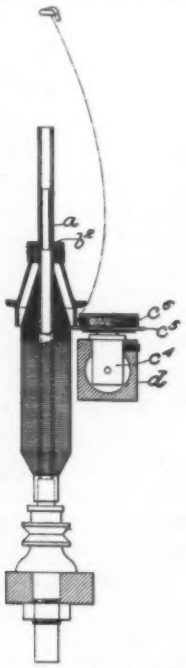
SPINNING COTTON YARN ON FRAMES WITHOUT RINGS OR TRAVELERS

BY GEORGE N. GODDARD

[A United States patent has recently been issued for a ringless spinning frame, the invention of the well-known inventor, Victor Belanger. It is the result of years of labor and experience in the development of frame spinning. We recently examined the new spinning invention. Two spindles on the frame were in operation. During our visit the same spindle spun 100s and 25s cotton yarn at a spindle speed of 12,400 revolutions per minute and without any change in the mechanism or in the ballooning of the yarn. The yarn was wound very hard and adhered firmly to the bobbin. It is a very interesting invention. The following account of the new spinning device, the character of the yarn spun, etc., has been prepared by George N. Goddard, who is associated with Mr. Belanger in its development. Ed.]

Spinners have often predicted that some day an invention would be made which would dispense with the use of travelers. Perhaps in most cases "the wish was father to the thought," and yet today in the opinion of some spinning experts this dream has been realized in the new Belanger ringless spinning invention, the patent for which was issued March 12, 1912. It has been named the "New Era."

This invention combines the best features of flier spinning and cap spinning with wholly new features possessed by neither, but without the well known defects and limitations of flier spinning and cap spinning. As in flier spinning the yarn-engaging member is positively driven, while the obvious



THE "NEW ERA" RINGLESS SPINNING FRAME.

limitations and difficulties incident to the differential mechanism, by which the flier spun yarn is wound on the bobbin, are wholly avoided by allowing the yarn to slip circumferentially from the yarn-engaging member or cap in order to wind on the bobbin. The only limit to the speed attainable is the mechanical limitation imposed by the spindle bearing, as the device operates with certainty and with freedom from breakages of ends at any rate of speed at which it is possible to drive the spindle.

The invention is easily applied to existing ring frames, since it only involves a removal of the ring rail and the traveler rings and the substitution of a modified rail, which forms the support and traverse member for the caps. Inasmuch as a bobbin of the smallest possible size that can go over the spindle can be used with any diameter of cap, the device makes possible the use of a metal bobbin consisting essentially of a plain cylindrical tube, a, provided with a longitudinal groove extending from top to bottom, forming a keyway into which projects an internal key of the cap, so that the cap has entire freedom of vertical traverse to build the cop, while it is positively rotated by this splined engagement with the bobbin.

Instead of employing a long cap of sufficient interior depth to cover the entire length of the completed cop, Mr. Belanger uses a short cap whose effective interior length is but slightly greater than the length of the chase of the cop in a filling wind. The upper or neck portion of the cap is provided with a bushing or sleeve, b2, which carries an inwardly projecting key which extends into the keyway or groove formed in the bobbin. This insures positive rotation of the cap by the spindle. The lower edge of the cap is made smooth, is of cylindrical form and rests upon the laterally projecting flange, c5, of a small idler wheel or bearing member, c6, which is carried by a pin or miniature spindle member, supported in an oil bolster which is practically a small replica of a spindle bearing. For convenience in lubrication the bolsters, c4, are carried in a hollow traverse rail, d, whose interior forms an oil reservoir from which oil can flow into each bolster through suitable openings formed in the bolster, so that all of the bearing members or idlers are supplied from a single source, which can be filled at a single point on the rail. The oiling is, therefor, a simple matter and one oiling will last for several months.

The thing that has most perplexed the spinners who have seen it in operation is how the revolving or "ballooning" yarn gets by. As shown in the illustration the yarn passes from the bobbin directly outward beneath the lower edge of the cap and between the cap and its supporting bearing wheel, c5 and c6. At each revolution the yarn passes between these two members but without the slightest injury or detriment. Indeed the idler seems to have in some degree the action of a retarding device in assisting the retardation of the revolving yarn. The

resistance of the air incident to such high speeds is also an important factor in retarding the yarn, so as to cause it to wind on the bobbin. The building of the cop is accomplished by the reciprocation of the traverse rail, precisely as in the case of a ring frame for a filling wind.

An exceedingly simple and effective anti-ballooning attachment, not shown in the cut, serves to reduce the ballooning without placing undue stress or tension on the yarn, so that the finer counts of yarn have been spun on a standard gauge frame clear down to the base of the bobbin at a spindle speed of 12,400 r. p. m., without the use of any separators whatever. Another surprising feature of the invention is the remarkable firmness of the cop, although the tension on the yarn is relatively light as compared with ring spinning.

The range of work possible is almost incredible since without change of cap or bobbin, yarn of the most superior quality ranging from number 4 or 5 up to number 200 can be and has been spun. Indeed a most interesting demonstration has been made by spinning the counts of yarn above specified without changing the speed of the delivery roll, which remained at 120 r. p. m. during the whole test, the spindle speed being 12,400 net. It is probable, however, that there will be two sizes or weights of cap made, one for medium and fine yarn, and the other for the coarse heavy yarns. The quality of yarn seems to be superior to either ring spun yarn or mule spun yarn. In uniformity of twist, evenness, strength and elasticity, the yarn is unsurpassed. An interesting discussion has arisen among practical spinners who have studied this device, some maintaining that in view of the strength and evenness of the yarn produced on this device, even when very slackly twisted, that in the future instead of producing two distinct kinds of yarn, namely, warp and filling for weaving purposes, there will be produced a uniform slackly twisted yarn of relatively great strength, which will be employed for both warp and filling. The yarn produced has a peculiarly soft feeling in comparison with the relatively harsh feeling of ring spun yarn of the same weight and twist made from the same roving.

It is confidently stated that breakages now occasioned by the traveler will be eliminated by this device, so that the only breakages to be experienced will be such as sometimes occur in the roving before it passes through the drawing-rolls. This of course would mean a great saving in lap-waste, as well as in cost of attendants. All mill men who are interested are cordially invited to witness the invention in operation at 62 Sudbury St., Boston.

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SOME APPLICATIONS OF BALL BEARINGS IN TEXTILE WORK

If the superintendent of a large textile mill were asked in what particulars he would like to see the bearings of his transmission and machinery improved, he would probably rank his requirements in their order of importance about as follows:

Cleanliness.

Accurate and constant alignment.

Small need of attention and repairs.

Ability to stand high speed.

Power economy over long lines of shafting.

The textile industry shares with the flour milling and cereal industries a peculiar need for cleanliness in its machinery, since creeping or dripping oil may soil the yarn and fabrics and increase unreasonably the percentage of seconds. Additional labor is required also where oil is wasted, and the expense for lubricants is excessive precisely in the ratio that oil is wasted instead of used.

The need for exact alignment appears chiefly in the machinery, and it is closely related to the need that this alignment shall be maintained as long as possible without refitting. If a bearing runs hot and wears loose, the machinery must be shut down for repairs, and the idle time of the investment must be added to the labor cost of refitting.

Many textile machines run at speeds beyond the ability of ordinary oil lubrication to handle without constant attention. This is particularly true of vertical spindles, which are proverbially difficult to lubricate properly without waste of oil, and which for this reason are usually half lubricated by wicking, and therefore consume excessive power.

The advantage of high speed is not limited to the machinery, but extends to the lineshafting as well, since with ordinary babbitted or cast iron hanger boxes it must run at a much slower speed than would otherwise be selected.

The subject of power economy in transmission is apt to be regarded as unimportant in relation to other items of expense. It is in reality unimportant only so long as no

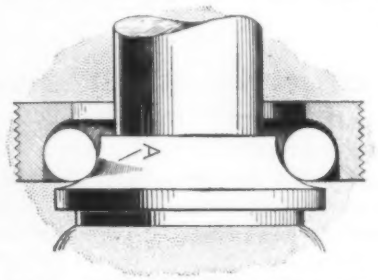


FIG. 1. THE EFFECT OF WEAR ON A CUP AND CONE BEARING.

way is found to save the waste. Assuming that the cost of power is no more than 6 per cent. of the cost of the product, it still remains true that from 1/4 to 1/2 of the total output of the power plant is probably wasted in friction before the spindles, looms, washers and dryers, etc., are reached. Part of this is lost in the lineshafting and part in the machines themselves. Assuming the avoidable loss to be no more than 25 per cent. of the total, this would amount to 1 1/2 per cent. of the cost of the product. If the maker's dividends are equal to 5 per cent. of the yearly cost of the product, it follows that the dividends could be increased to 6 1/2 per cent. simply by stopping the waste of power. Bearing these figures in mind, we

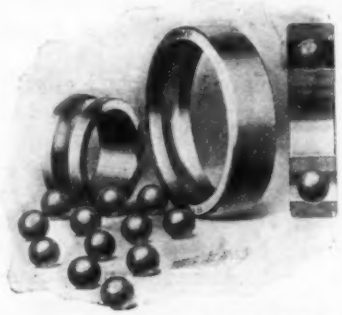


FIG. 2. HESS-BR GHT ANNULAR BALL BEARING (THE SEPARATOR IS OMITTED IN THE DISASSEMBLED VIEW).

see that economy in the first cost of the power plant and in the coal bill is cheaply earned at the price of anti-friction equipment to make sure that the power generated reaches the work, instead of merely wearing out oil, belting, and babbitt metal.

In the early days of ball bearings the adjustable types made familiar by our bicycle experience were used exclusively. These types served well enough for light work, but were unsuited to heavy duty for many reasons. The balls were too soft and too irregular in size to share their work equally; the cup and cones were roughly finished and only superficially hardened; dirt was not excluded nor oil retained; and the materials themselves were too soft or too brittle for

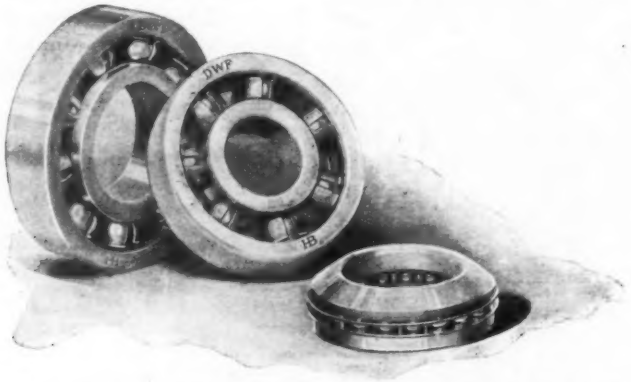


FIG. 3. TYPICAL HESS-BRIGHT ANNULAR AND THRUST BALL BEARINGS.

hard service. The adjustable feature itself was fundamentally wrong, for the user was certain to tinker with it and adjust it badly in doing so.

Aside from the defects of design and con-

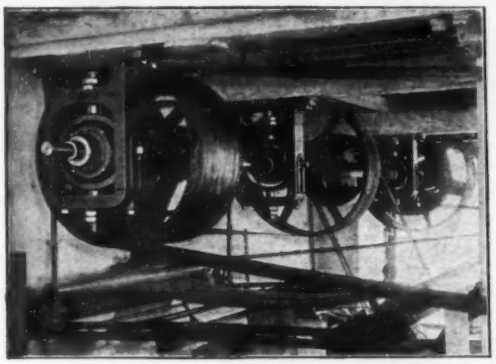


FIG. 4. MAIN DRIVING BELT IN A TEXTILE MILL SHOWING HESS-BRIGHT BALL BEARINGS

struction there was no trustworthy information to guide machinery builders in applying ball bearings to their own work. Hence it was not strange that ball bearings were for a time discredited.

investigate the whole subject experimentally. This research, which extended over several years, resulted in the abandonment of all types of adjustable bearings and the adoption for radical loads of what is now known as the annular type shown in Fig. 2. In this bearing the balls roll between two grooved races and the load is in the line of the contact points. End thrusts, where they occur, are taken separately by means of thrust bearings of the types shown in Fig. 3.

The annular bearing is non-adjustable, hence the greatest cause of deterioration is removed at the outset. Durability is secured, first, by the use of a bearing large enough to carry its load without sensible wear; second, by the use of modern alloy steels of extraordinary hardness and toughness, such as were unknown in the early bicycle days; third, by microscopic accuracy in grinding, sizing and finishing. Where formerly one-thousandth of an inch was thought a sufficiently close limit of error, one ten-thousandth of an inch is now required. Balls are sorted and graded to that limit of variation, and only balls within that

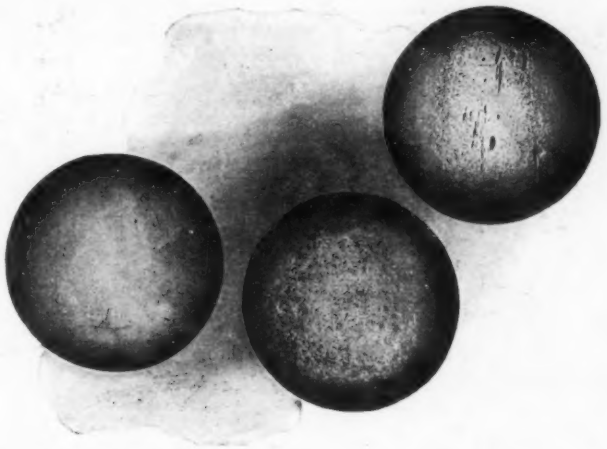


FIG. 4. MICRO-PHOTOGRAPHS OF BALL BEARINGS, THE LEFT HAND ONE IS A HESS-BRIGHT.

When the automobile began to be important in Germany, the importance of reducing the friction of transmission was realized. The German Small Arms and Ammunition Factories first took up the subject scientifically, by commissioning Prof. Stribeck of the Neubabelsberg Technical Laboratories to

limit are put into a given bearing. The surface of the balls is given a final mirror-like polish to remove even such scratches as a pocket lens might show, and this final polish is found to be an important factor in the durability of the bearing.

Such bearings as just described, when

properly mounted, lubricated with suitable oil or grease and protected from dirt and rust, may almost be said not to wear out at all. Their coefficient of friction is but 1/6 of 1 per cent., and their almost total absence of friction is in itself a good indication of their wearing qualities, since friction is the cause of wear, and where friction is absent wear is absent also.

During the past ten years these bearings have been used by the hundred thousand in automobiles, and their use is rapidly extending to many other classes of machinery where power must be saved or wear pre-

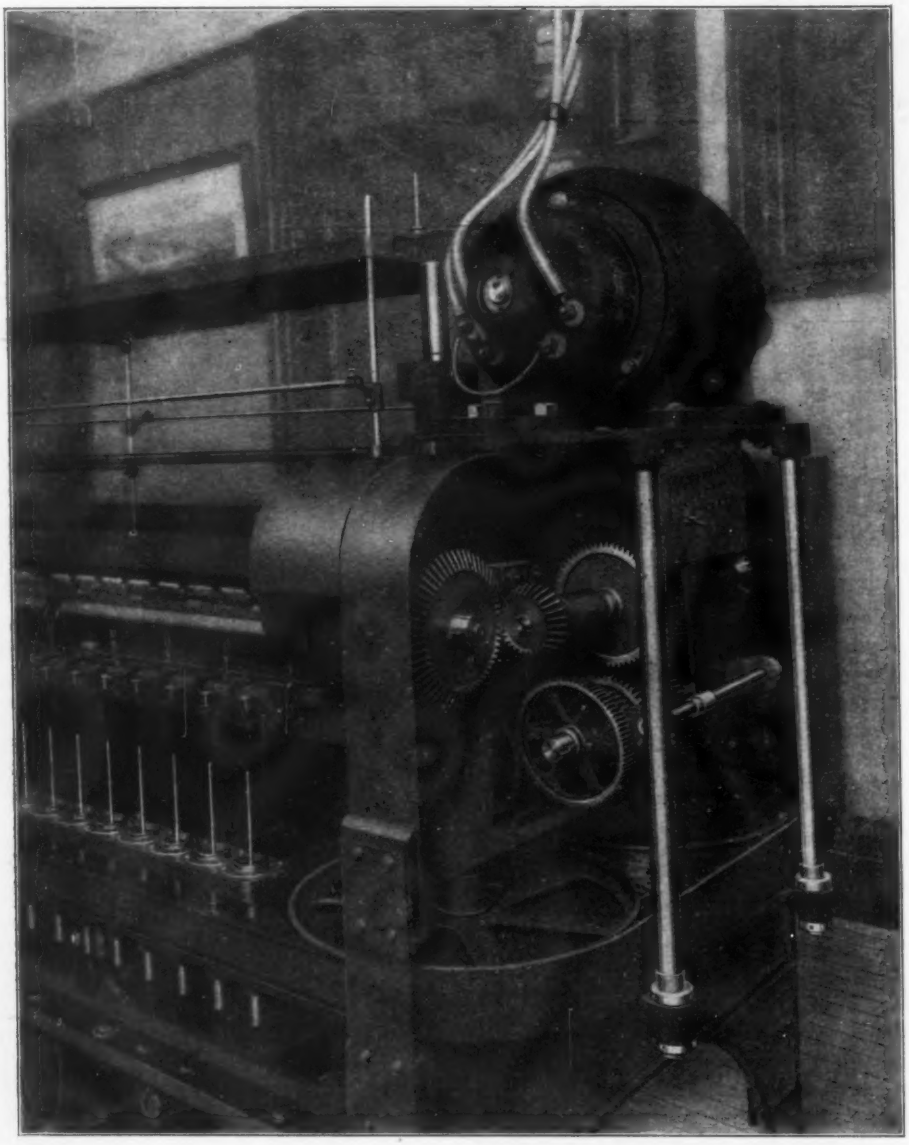


FIG. 6. THE BROWN SPIN-WRIGHT SPINNING FRAME, SHOWING HESS-BRIGHT BEARINGS.

vented. They are usually first adopted as a last resort, where it has been impossible to keep plain bearings cool and snug, and their satisfactory performance under the severe conditions thus imposed has soon led to their adoption elsewhere. In woodworking machinery, where speeds are high and oil lubrication difficult, and in flour milling machinery, where speeds are moderate but the pressures are so heavy to squeeze out the oil and cause hot boxes, these ball bearings have shown themselves far more durable than plain bearings under the best conditions. In machine tools power is saved and alignment of shafts is preserved. A striking application is to the motors and main journals of trolley cars and the armatures of mine locomotives. In the latter class of service, these bearings have been used in large numbers for some four years under conditions much more severe than trolley service, and have shown themselves to be notable savers of shop time and protectors of the machinery in which they are installed.

In the textile field ball bearings are recent on a large scale; in some machines they are fully four years old, with many years of life apparently to their credit. Lineshaft hangers of special design, adapted to the requirements of ball bearings, have been installed with much success in a considerable number of plants, both textile and others, and by saving friction they have released power to drive additional machinery without increasing the power plant. An illustration of these hangers is given at Fig. 5. It is detrimental to the life of any antifriction bearing to split the races, consequently the latter are continuous and the bearing is threaded over the shaft and fitted to the latter by a tapered split adapter sleeve, which is driven home and secured by a nut. The hangers are installed by uncoupling the shaft sections and putting up the hangers section by section. When once installed they run indefinitely with no attention save semi-annual refilling with oil or grease.

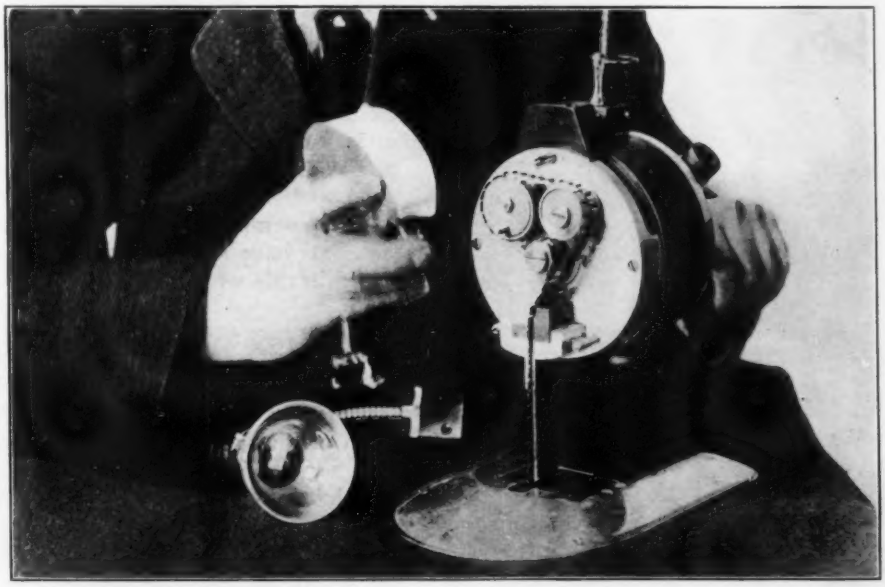
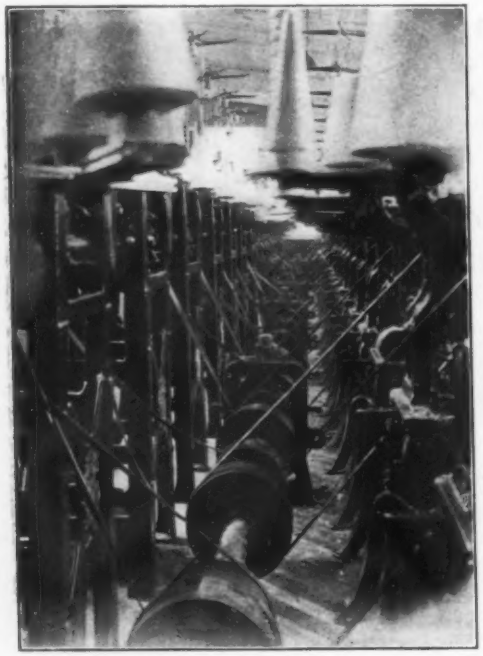


FIG. 7. A CLOTH CUTTING MACHINE MOUNTED ON HESS-BRIGHT BALL BEARINGS.

Ball bearings are under no such limitations as plain bearings as regards speed. It is perfectly practicable to run lineshafting as high as 1,000 r. p. m. in ball bearings, thereby reducing the pulley sizes and cutting down the cost of belting, etc. The counter shafts may be eliminated altogether, since

with their losses and cost, high speed machines can be driven direct from the line-shaft. As the ball bearing housings are of such shape as to retain the oil indefinitely, it follows that there is no creeping or dripping, and this source of damage to the product and of lubricant waste is avoided.

An interesting application of ball bearings in textile machinery is the spinning frame shown in Fig. 6. The large vertical driving



The Hess-Bright hangers in the Well Knit Hosiery Co., Harrisburg, Pa. The hangers are placed on the floor, and have a 12 inch drop from the center of the shaft to the floor.

shafts are mounted in annular ball bearings, and a 2 1/2 h. p. motor drives the whole. Formerly, when plain bearings were used, 7 1/2 h. p. was required and the bearings heated up so much that the machine could be run only half an hour at a time.

The garment cutting machine in Fig. 7 may fairly be said to owe its existence to ball bearings. It weighs but 15 lbs., and does the work of a plain bearing machine weighing twice as much. Its motor is 1/4 h. p., and ball bearings are used on the armature shaft and in the adjacent idler sprockets. The motor drives an endless chain of cutter knives at a speed of 625 ft. per minute.

Ball bearings have been applied also to napping machines, spinning frames and other machines. Their advantages are especially great where the speed or pressures are such that oil lubrication presents difficulties. As an example might be mentioned rag-picking machines, which run at a speed of 3,000 r. p. m. or thereabouts. These machines wear out plain bearings very rapidly, and are difficult to keep cool under the most favorable circumstances.

In the present age of increasing competition and of study to eliminate waste expenditures, it seems certain that the economies offered by the elimination of friction in line-shafting and in the main bearings of industrial machinery are too important to be overlooked, and it is only a question of demonstrating generally what is already known to a few to have ball bearings universally adopted in this work.

FALLS SYSTEM OF GREASE LUBRICATION

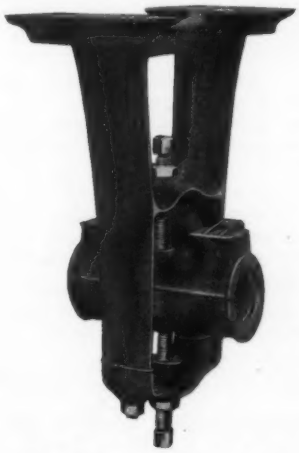
With the proper application and selection of grease for a lubricant, the co-efficient of friction may be greatly reduced. After continual service it can be shown that the grease-lubricated bearing, owing to the low up-keep and efficiency, will compare favorably with other methods of reducing friction. After a thorough investigation of this question The Falls Rivet & Machinery Co., of Boston, Mass., and Cuyahoga Falls, O., have placed on the market a line of bearings for their drop hangers, post hangers and pillow block frames designed to give the maximum efficiency. The principal object in all journal lubrication is to keep a film of lubricant between the rotating and stationary parts. The object is to distribute properly the lubricant and to keep it in contact with the shaft as nearly the entire length of the journal as is possible.

The new bearing, it is claimed, meets every requirement. The grease lubricant is placed in large and capacious cups from which it passes to about one-third of the entire frictional surface of each journal.

To retain as thin a film of lubricant between the journal and bearing and reduce

the consumption consumed, it was found necessary to apply a specially prepared yarn on either side where the lubricant comes in contact with the journal; in this manner uniform lubrication was attained.

The lubricant may be any of the many



AN IMPROVED SELF OILING BEARING.

greases now on the market, but a specially prepared fibrous grease is recommended.

With this system of bearings, line shafts have been operated from one to two years with one application. It is claimed the bear-

AN IMPROVED SELF OILING BEARING.

ing will operate satisfactorily from six months to one year with one application, and when using the fibrous grease it is impossible to heat the bearing or journal.

The principal industry of Ghent is cotton, flax, and hemp spinning; there are forty-one mills in the district, having in all 1,350,754 spindles. In addition, weaving, bleaching, and dyeing are carried on to a large extent.

MILL NEWS

South Carolina, Yorkville. On April 15 the Tavora Cotton Mills will be offered for sale. No bid lower than $25,000 will be accepted. The mills are in operation at the present time, employing about 45 operatives.

Tennessee, Knoxville. Chas. A. Weller of Knoxville is interested in bringing the Heck Silk Co. of Paterson to Knoxville and increasing the equipment from 54 to 100 looms. The plant is located at 64 Ryle Ave., Paterson, and manufactures dress, tie and lining silks.

*Tennessee, Nashville. A special committee of the Nashville Industrial Bureau is at work on the proposition of Thos. A. Miller of Greenville, S. C., to establish a $500,000 cotton mill in Nashville.

Texas, Brady. J. T. Mann heads a movement to secure a cotton mill for Brady. He states that they are located in a large cotton growing section with good railroad facilities and altogether an ideal location for cotton manufacturing.

Texas, Corsicana. At the annual meeting of the stockholders of the Corsicana Cotton Mills, C. H. Allyn was elected president. The remaining officers are J. A. Thompson and J. E. Whiteselle, vice-presidents; M. E. Woodrow, secretary, and E. E. Sheeley, treasurer. From the earnings of the past year $10,000 was paid into surplus. The company has equipment of 5,000 ring spindles and 150 looms, making flat cotton duck.

Texas, Dallas. The Consumers' Lignite Co. are reported as contemplating the establishment of a small cotton mill near mining properties in which they are interested and invite correspondence from machinery manufacturers.

Texas, Merrimac. G. W. Garrett, 337 Federal Bldg., Detroit, Mich., is investigating the manufacture of comforters from cotton purchased directly from the farmer's wagon and should the plan prove feasible he will establish a small plant here for this purpose. He plans to give employment to 10 to 20 hands and if his investigation proves favorable to build a small plant next fall. He plans to sell the product direct. Mr. Garrett was recently interested in establishing a cotton mill in Texas.

*Vermont, Brattleboro. Several looms are now running in the new Fort Dummer Mills, and it is expected that the humidifying system will soon be installed. With the erection of the drawing frames, each department has at least part of its equipment, and it is now possible to put the raw material through every process of its manufacture.

Washington, Chehalis. The Chehalis Flax Fibre Co. has resumed manufacturing heavy twine, with Wm. J. Cunningham in charge of the plant. Twelve people are employed.

*Wisconsin, Milwaukee. The Milwaukee Wadding & Comfort Mills, reported incorporated early in February with capital stock of $10,000, makes wool wadding, batts and comforts on 2 cards, operating by electric power. The plant is located at 911 32d St. Frank J. Maley is president, superintendent and buyer, and O. C. Bader is treasurer.

Personals

C. W. Brazeol has been appointed overseer of carding and spinning at the Thread Mills Co., Draper, N. C. He comes from Rossville, Ga.

Calvin E. Wilson has been appointed overseer of drawing, spinning and reeling at the Allendale Worsted Mills, Allendale, R. I. He was formerly employed at the Arlington Mills, Lawrence, Mass.

William H. Lane has accepted the position as overseer of carding at the Fuld & Hatch Knitting Co., Cohoes, N. Y., on the night shift. He comes from Chester, Pa.

Martin Schoonman has been appointed overseer of spinning at the Greylock Mills, Williamstown, Mass. He was formerly engaged at the Grant Yarn Co., Fitchburg, Mass.

Thomas H. Duggan has accepted the position of overseer of finishing at the Auburn Woolen Co., Peterboro, Ont., Canada. He comes from the Allen Woolen Co., Rochester, N. Y.

W. H. Walsh has accepted the position as overseer of weaving at the Daniels Worsted Mill, Worcester, Mass. He was formerly employed at the Waterhouse & Howard Mill, North Adams, Mass.

Henry Stewart has been appointed overseer of finishing at the Akela Mills, Pascoag, R. I., succeeding Thomas J. Jennings.

Joseph Miller, overseer of carding at the Assawaga Co., Dayville, Conn., has resigned to accept a similar position with the Germania Mills, Holyoke, Mass.

Charles Fralick has been appointed overseer of carding at the Assawaga Co., Dayville, Conn. He was formerly employed at the Woodside Woolen Co., Northboro, Mass.

Fred Steel, superintendent of the Waypoyset Mfg. Co., Central Falls, R. I., has been appointed agent of the Fisher Mfg. Co., Fisherville, Mass. He succeeds A. W. Dimmick.

Frank Singleton, designer at the Huntington Mfg. Co., Huntington, Mass., has severed his connection with that company.

John Mulligan, overseer of weaving at the South Bend Woolen Co., South Bend, Ind., has severed his connection with that company.

T. A. Fox, superintendent of the woolen department of the Hewson Pure Wool Textiles, Ltd., Amherst, N. S., Canada, has been promoted to the position of assistant manager. Arthur Benson has been appointed superintendent to take the place of T. A. Fox, and George W. Engel has been appointed assistant superintendent and designer for this company.

Peter Sheehan has accepted the position as overseer of dressing for the company which is starting the Concord Mfg. Co., at Penacook, N. H.

George W. Overend, superintendent of the Pondicherry Co., Bridgton, Me., has severed his connection. He has been in their employ for a number of years.

Joseph Bonin, overseer of carding at the Interlaken Mills, Arkwright, R. I., has severed his connection with that company.

Charles A. Julia has been appointed agent of the Pondicherry Co., Bridgeton, Me. Mr. Julia has now three mills under his charge, the Cowan Woolen Co. and the Farnsworth Co. of Lisbon Centre, Me

E. Allen Crowell has accepted the position as overseer of dyeing at the Amherst Mfg. Co., Amherst, Mass. He was formerly employed at the Faulkner & Colony Mfg. Co., Keene, N. H.

Thomas Ellis has accepted the position as overseer of spinning, twisting and Jack spooling at the Star Worsted Co., Fitchburg, Mass.

A. Morrison, overseer of weaving at the Garland Woolen Co., Staffordville, Conn., has resigned.

J. W. Morton has been appointed superintendent of the Broad Brook Co., Broad Brook, Conn., succeeding Benjamin Armitage.

John Carey has accepted the position as overseer of dyeing at the Angus Park Mfg. Co., East Glastonbury, Conn. He was formerly second hand in the dye house at the Warren Woolen Co., Stafford Springs, Conn.

William Watson, overseer of carding for Gardiner Hall, Jr. & Co., South Willington, Conn., has severed his connection with that company.

James T. Bain, overseer of dyeing at the Bay State Worsted Co., Worcester, Mass., has resigned. Fred Jackson has again accepted the position.

Benjamin Armitage, superintendent of the Broad Brook Co., Broad Brook, Conn., has severed his connection with that company. Mr. Armitage has been in the employ of this concern for a number of years as designer, and was later appointed superintendent. His intention is to visit his old home in England.

George Scherier has accepted the position as overseer of finishing at the Saxton's River Woolen Co., Saxton's River, Vt.

Oscar Dietrich, designer at the Ounegan Mill, American Woolen Co., Old Town, Me., has resigned to accept the position of superintendent of the Pondicherry Co., Bridgton, Me.

George F. Lawrie, senior member of the firm of Lawrie, Mann & Drowne, dry goods commission merchants of New York City, died at his home of pneumonia at the age of 60 years. He had been confined to his home for several weeks. He is survived by a widow and two sons.

Thomas J. Jennings, overseer of finishing at the Akela Mill, Pascoag, R. I., has severed his connection with that company.

Jean Guyer has accepted the position as superintendent of the broad silk department of the Brainerd & Armstrong Silk Co., New London, Conn.

Thomas Morrissey has accepted the position as overseer of weaving at the Hamilton Mfg. Co., Lowell, Mass. He comes from Moosup, Conn., and was formerly employed at the Aldrich Mfg. Co., but had not been in their employ for some years.

William Finlay, master mechanic at the Wuskanut Mills, Farnumsville, Mass., has severed his connection with that company to accept a similar position with the Boston Mfg. Co., Waltham, Mass.

William B. Orr, treasurer and agent of the Forestdale Mfg. Co., Forestdale, R. I., was elected president of the Winnesuqet Country Club, at the annual meeting which was held recently.

S. G. Touchstone, formerly overseer of carding at the Fulton Bag & Cotton Mills, Atlanta, Ga., has resigned to become superintendent of the Great Falls Mfg. Co., Rockingham, N. C.

A. E. McDonald has been appointed superintendent of the J. Frederick Houston & Co.'s mill at Cumberland, N. C.

Herman Shulze has accepted the position as designer at the Louisville Woolen Mills, Louisville, Ky. He was formerly employed at the Assabet Mills, Maynard, Mass.

A. L. Marshall, overseer of weaving at the Pontoosuc Woolen Mfg. Co., Pittsfield, Mass., has severed his connection with that company. He is succeeded by his son, Charles A. Marshall, who has been assistant overseer.

Joshua Parker, for the past twenty-five years wool buyer and overseer of wool sorting at the Globe Woolen Co., Utica, N. Y., has severed his connection with that company. He is succeeded by Walter Court, who has been assistant foreman of the wool sorting department.

James Talbert has accepted the position as overseer of spinning at the Magnolia Mills, Concord, N. C.

W. H. McDaniel has been appointed superintendent of the Alabama Cotton Mills, Speiner, Ala. He comes from Macon, Ga.

George H. Asquith, Jr., overseer of carding at W. J. Dickey & Sons, Inc., Oella, Md., has severed his connection with that company.

George Smedden has been appointed superintendent of the Grinnell Mfg. Co., New Bedford, Mass., to succeed A. C. Thomas. Mr. Smedden has been master mechanic of this mill for a number of years.

T. E. Marshall, recently buyer for the Deep River Mills, Randleman, N. C., has been elected secretary and treasurer of the Tarboro Cotton Factory, Tarboro, N. C.

Lomas H. Quinn has accepted the position as overseer of carding at the Vivian Mills, Cherryville, N. C.

A. D. Martin has accepted the position as overseer of weaving, slashing and cloth room at the Shelby Cotton Mills, Shelby, N. C. He comes from the Woodside Cotton Mills, Greenville, S. C.

Alexander Davis, formerly of Tallasee, Ala., has accepted a position as overseer of weaving at the Avondale Mills, Birmingham, Ala.

J. B. Bailey, overseer of weaving at Seneca, S. C., has resigned to accept a similar position at the Norris Cotton Mill, Cateechee, S. C.

Arthur Standfast has accepted the position as overseer of dyeing at the Union Bleaching & Finishing Co., Greenville, S. C. He comes from the Arnold Print Works, North Adams, Mass.

Robert Wilson, Jr., overseer of carding at the Manchester Mfg., Manchester, Ga., has resigned to accept a position at the Eagle & Phoenix Mills, Columbus, Ga.

Frank Queen has accepted the position as overseer of carding at the Wadesboro Cotton Mills, Wadesboro, N. C. He comes from King's Mountain, N. C.

Frank Wood has been appointed overseer of finishing at the Rochdale Mill, American Woolen Co., Rochdale, Mass.

John E. Moffitt has been appointed overseer of spinning at the Rochdale Mill, American Woolen Co., Rochdale, Mass.

Henry Muller has accepted the position as overseer of dyeing at the Mankato Mills Company, Mankato, Minn. He was formerly employed at the Shamrock Mills, Winston-Salem, N. C.

Richard Driscoll has accepted the position as second hand in the spinning room at the Chicopee Mfg. Co., Chicopee Falls, Mass.

Henry T. Bailey has accepted the position as overseer of carding at the Boott Mills, Lowell, Mass. He was formerly cotton sampler at the Davis Mills, Fall River, Mass.

Robert G. Campbell, general superintendent of the White Oak and Proximity Mills, Greensboro, N. C., has tendered his resignation. He has been connected with these mills for the past seven years.

James S. Bradbury, cotton sampler at the Dwight Mfg. Co., Chicopee, Mass., has severed his connection with that company.

R. W. Herd has been promoted to second hand of spinning at the No. 2 Mill of the Victor Mfg. Co., Greer, S. C.

C. C. Trull has accepted the position as overseer of carding at the Capitola Mfg. Co., Marshall, N. C. He comes from the Arlington Mill, Gastonia, N. C.

Walter B. Snow, publicity engineer, 170 Summer St., Boston has increased his organization by the

addition of Charles L. Mulligan, late of the editorial staff of the Brooklyn Standard Union, and for a considerable period associated with the publicity department of the Western Electric Co.

Samuel C. Rowe has been appointed overseer of bleaching at the Riverside & Dan River Cotton Mills, Danville, Va. He comes from Lowell, Mass.

G. P. Jeter, formerly superintendent of the Exposition Mills, Atlanta, Ga., has accepted a similar position with the Henderson Cotton Mills, Henderson, Ky.

H. B. Massey has accepted the position as overseer of carding at the Fidelity Mills, Charlotte, N. C.

E. S. Williams, overseer of weaving at the Nokomis Cotton Mills, Lexington, N. C., has resigned.

Lynn Sampson has accepted the position as overseer of spinning at the Indian Spring Mill, American Woolen Co., Madison, Me.

Frank A. Nichols has accepted the position as overseer of weaving at the Woolen Mfg. Co., Beaver Dam, Wis. He was formerly employed at the South Bend Woolen Co., South Bend, Ind.

George Davis, for the past 20 years overseer of the mule spinning department at the Royal Mills, Riverpoint, R. I., has resigned. Mr. Davis has accepted a more responsible position with the Stark Mills of Manchester, N. H., as overseer of ring spinning.

John E. Allen, for the past three years superintendent of machinery in the various Shamokin and Trevorton, Pa., silk mills of J. H. & C. K. Eagle, Inc., has resigned. Mr. Allen will return to Belvidere, N. J., where he will resume a responsible position with the Bamford Bros. Silk Mfg. Co., with which he was formerly connected.

John Shaw, overseer of weaving at the Anco Mills, Wilkinsonville, Mass., has resigned.

H. L. Gammage has severed his connection with the R. I. Worsted Co., Stafford Springs, Conn., as designer and is succeeded by John Gormley, Jr., formerly designer at the Hoosac Worsted Mill, North Adams, Mass.

James Heffernan has been appointed overseer of dressing at the Nasonville Woolen Co., Nasonville, R. I. He was formerly second hand in the dressing department at the Saranac Mills, Blackstone, Mass., and is succeeded by John Wilcox at the Saranac Mill.

W. L. Sjostrom, superintendent of the Lawrence Dye Works Co., Lawrence, Mass., has been appointed assistant agent of this company.

Robert E. Reynolds, overseer of finishing at the J. D. Clark Co., Rochdale, Mass., has severed his connection with that company. He is succeeded by John W. Bullard, who was formerly employed at the Woolen Mfg. Company, Beaver Dam, Wis.

Alfred Proulx, formerly superintendent of the Taunton Hosiery Co., Taunton, Mass., has accepted a similar position with the Standard Textile Co., Woonsocket, R. I.

David A. Provost, overseer of dyeing for Taylor & Bell, Quinapoxet, Mass., has severed his connection with that company.

C. W. Stowe has accepted a position as overseer of spinning at the Marlboro No. 4 Mill, McColl, S. C. He was formerly employed at the Fidelity Mills, Charlotte, N. C.

J. B. Moore, formerly night overseer of carding and spinning at the Cleghorn Mills, Rutherfordton, N. C., has resigned to accept a position as overseer of carding and spinning at the Buffalo Mfg. Co., Stubbs, N. C.

T. B. Moore has accepted the position as superintendent of the Hanes Spinning Co., at Winston-Salem, N. C. He comes from the Erwin Mill, No. 4, West Durham, N. C.

J. L. Davidson has been appointed superintendent of the Stonewall Cotton Mill, Stonewall, Miss. He comes from the Henderson Cotton Mill, Henderson, Ky.

J. H. Wilson has accepted the position as overseer of carding and spinning at the John M. Stone Cotton Mills, Starkville, Miss. He comes from the Lafayette Cotton Mill, Lafayette, Ga.

Walter Nieber has been appointed designer at the Darling Woolen Mills, Holliston, Mass. He comes from North Bellingham, Mass.

John Wilkinson, formerly overseer of weaving at the Northern Ohio Blanket Mills, Cleveland, O., has accepted the position as superintendent of the Davenport Woolen Co., Davenport, Ia., succeeding Jere Emery.

John L. Robinson, overseer of carding at the Capital City Mills, Columbia, S. C., has resigned.

E. E. Bowen, formerly overseer of weaving at the Steele Mfg. Co., Rockingham, N. C., has resigned and is to accept the position of designer and overseer of weaving at the Wylie Mfg. Co., Chester, S. C.

A. D. Martin has accepted the position as overseer of weaving at the Shelby Cotton Mills, Shelby, N. C. He comes from the Woodside Mill, Greenville, S. C.

A. R. Ennis, overseer of spinning at the Elk Cotton Mills, Fayetteville, Tenn., has resigned to accept the position as overseer of carding at the Knoxville Spinning Mills, Knoxville, Tenn.

John L. Robinson, formerly overseer of carding and spinning at the Capitol City Mills, Columbia, S. C., has resigned to accept a position as overseer of carding at the Fulton Bag & Cotton Mills, Atlanta, Ga.

J. H. Reid has accepted the position as overseer of weaving at the Roanoke Cotton Mills, Roanoke, Ala. He comes from Langdale, Ala.

Charles B. French, for a number of years master mechanic on the Northern division of the Amos-

keag Mfg. Co., Manchester, N. H., has been appointed to the position of superintendent of shafting, a new position created recently and will have charge of the shafting in the mills.

Charles Drinkwater has been appointed manager of the Holmes Silk Co., Williamsport, Pa., succeeding George B. Bannigan.

T. S. Hunt has been appointed superintendent of the Louisville Woolen Mills, Louisville, Ky., succeeding T. L. Parker, who has accepted a similar position with the Peerless Woolen Co., Rossville, Ga.

Edgar W. Larrabee has been appointed paymaster at the Jackson Co., Nashua, N. H. He was formerly employed at the Massachusetts Mills, Lowell, Mass., on the clerical force.

George Smith has been appointed overseer of the beaming department at the Kerr Mill, Fall River, Mass. He has been in the employ of this concern for a number of years.

C. S. Gregg has accepted the position as overseer of weaving in the Cannon Mill No. 3, Concord, N. C. He comes from Roanoke Rapids, N. C.

W. N. Wilson, assistant superintendent of the Hamer Cotton Mills, Hamer, S. C., has resigned to accept the position of overseer of carding and spinning at the Fidelity Mfg. Co., Charlotte, S. C.

D. C. Anderson has accepted the position as overseer of carding at the Elk Cotton Mills, Fayetteville, Tenn.

J. F. Broom, overseer of spinning at the Hope Mills Mfg. Co., Hope Mills, N. C., has resigned to accept a similar position with the Locke Mills, Concord, N. C.

D. E. West, superintendent of the Fountain Inn Mfg. Co., Fountain Inn, S. C., has resigned.

Arthur Barnett has accepted the position as overseer of spinning at the Fountain Inn Mfg. Co., Fountain Inn, S. C.

W. H. Hearn, formerly overseer of spinning at the Highland Park No. 3 Mill, Charlotte, N. C., has been appointed superintendent of the Magnolia Mills, Charlotte.

J. C. Tiddy has accepted the position as overseer of spinning at the Maple Cotton Mills, Dillon, S. C.

E. C. Taylor, for the past three years with the Dan River Cotton Mills, Danville, Va., has resigned to accept the position as night overseer of weaving at the Buck Creek Cotton Mills, Siluria, Ala., succeeding J. W. Hood.

F. G. Asbell, formerly of Randleman, N. C., has succeeded W. W. Gregg as overseer of carding at the Kinston Cotton Mills, Kinston, N. C.

H. R. Davis has been promoted from the position of overseer of weaving to superintendent of the Globe Mill, Augusta, Ga.

D. V. Brannon, superintendent of the Ottaray Mills, Union, S. C., has resigned, and returned to his former position as overseer of weaving at that mill.

R. C. Collins has accepted the position as overseer of spinning, spooling, reeling and twisting for the Gray Mfg. Co., Woodruff, S. C. He comes from Fountain Inn, S. C.

Arthur W. Pitts, overseer of carding and spinning at the Guadalupe Valley Cotton Mills, Cuero, Tex., has resigned to accept the position as overseer of carding at Siluria, Ala.

George Banning has resigned his position as superintendent of the Williamsport, Pa., Mill, of the Home Silk Co., and is succeeded by Mr. Drinkwater.

Wm. Knowles, overseer of weaving at the Woolen Mfg. Co., Beaver Dam, Wis., has severed his connection with that company.

James Turnbull has accepted the position as overseer of dressing and spooling at the Yantic Woolen Co., Yantic, Conn. He was formerly employed as overseer of dressing, spooling and drawing-in at the Iroquois Mill, U. S. Worsted Co., Saugus, Mass.

Wm. Marshall, overseer of spinning at the Lincoln Woolen Co., Camden, Me., has severed his connection with that company.

William J. Henry has accepted the position as master mechanic at the O'Neill Silk Company, Hanover, Pa.

Elmer Langdon, who recently resigned his position as overseer of weaving at the Ellis & Co.'s No. 1 Mill, Monson, Mass., has left with his wife for California, where they will take up their home.

Mathias Ousley has been appointed overseer of spinning at the Royal Mill, Riverpoint, R. I. He comes from the Samoset Co., Valley Falls, R. I.

Earl A. Thissell, retired treasurer of the Lowell Hosiery Co., Lowell, Mass., was presented with a generous sum of money by his associates with the wish of the donors that he purchase something which would be a reminder of the past.

W. R. Atherton, overseer of carding at the Echota Mills, Calhoun, Ga., has resigned to accept a position with the Henderson Cotton Mills, Henderson, Ky.

P. M. Tice has accepted the position as overseer of spinning at the Anderson Cotton Mills, Anderson, S. C. He formerly held a similar position with the Franklin Mills, of Greers, S. C.

L. W. Redd has been appointed superintendent of the Palmetto Cotton Mills, Columbia, S. C., having resigned as overseer of the cloth room at the Calhoun Mill, Calhoun Falls, S. C.

Clayton Montjoy, overseer of weaving at the Union Cotton Mills, Union, S. C., has resigned to become superintendent of the Ottaray Mills, Union, S. C.

Ephriam Berggren, for the past 16 years employed for W. E. Hayward & Co., East Douglas, Mass., has resigned to accept the position as overseer of carding at the Putnam Woolen Co., Putnam, Conn.

W. W. Cobb has accepted the position as overseer of spinning at the Greer Mfg. Co., Greer, S. C. He comes from Williamston, S. C.

John H. Prescott has accepted the position as overseer of knitting at the Kingston Hosiery Co., Kingston, Ont., Canada. He comes from Stoughton, Mass.

J. F. Brown has accepted the position as overseer of spinning at the Locke Mills, Concord, N. C. He comes from Cotton, N. C.

A. W. Greer, overseer of carding at Siluria, Ala., has resigned to accept the position of overseer of carding and spinning at the Kincaid Mills, Griffin, Ga.

F. C. Henderson, formerly overseer of spinning, spooling, warping, twisting and slashing at the Meritas Mill, Columbus, Ga., has resigned to accept a similar position with the Columbus Mfg. Co., same place.

J. Arnold Cooper, master mechanic at the Rochdale Mills, American Woolen Co., Rochdale, Mass., has severed his connection with that company to take up a similar position with F. A. Howarth & Son, Oxford, Mass.

Richard A. Borner, formerly superintendent of the Bradford Mills, John & James Dobson, Philadelphia, has accepted a position as designer with the Arlington Mills, Lawrence, Mass.

John P. Shaw has accepted a position at the Manhassett Mfg. Co., Putnam, Conn. He was formerly employed at the Anco Mills, Wilkinsonville, Mass.

L. S. Lahey has been appointed overseer in the gray goods weaving department in the ribbon mills of the Cheney Bros., South Manchester, Conn.

Robert Linn, Jr., assistant superintendent of the Linn Woolen Co., Hartland, Me., has resigned.

John Cassidy has accepted the position as overseer of dyeing at the Warren Woolen Co., Stafford Springs, Conn., succeeding Jacob P. Wagner.

C. C. Arthur has accepted the position as overseer of carding and spinning at the Itasca Cotton Mills, Itasca, Tex.

M. M. Lindsay, overseer of carding at the Cliffside Cotton Mills, Cliffside, N. C., has resigned.

Leroy C. Lewis, formerly boiler foreman at the Champlain Silk Mills, Whitehall, N. Y., has accepted a position in the Bureau of Standards, Washington, D. C., as textile expert.

William Marshall has accepted the position as overseer of spinning at the Garland Woolen Co., Staffordville, Conn. He was formerly employed at the Lincoln Woolen Co., Camden, Me.

Forster G. Heaton has accepted the position as overseer of dyeing at the Beaver Brook Mills, American Woolen Co., Collinsville, Mass. He was formerly employed at the Bay State Mills, Lowell, Mass.

Arthur O. Torrey has accepted the position as overseer of finishing at the Lebanon Mills, American Woolen Co., Lebanon, N. H. He was formerly employed at the Rock Mfg. Co., Rockville, Mass.

Harry Hewitt has accepted the position as assistant superintendent of the Elmville Worsted Mill, Danielson, Conn. He comes from Stafford Springs, Conn.

T. C. Doyle has been appointed superintendent of the Martinsburg Worsted & Cassimere Co., Martinsburg, W. Va. He was formerly superintendent and designer at the Virginia Woolen Co., Winchester, Va.

J. H. Tierney has accepted the position as assistant superintendent at the Linn Woolen Co., Hartland, Me. He comes from Claremont, N. H.

A. P. Foster, overseer of spinning at the Indian Spring Mill, Madison, Me., has severed his connection with that company to accept a position with the Davis & Furber Machine Co., North Andover, Mass.

Frank R. Vose, foreman of the wood working department at the Amoskeag Mfg. Co., Manchester, N. H., has been promoted to the position of dispatching agent. Mr. Vose was presented with a beautiful quartered oak gun cabinet.

Frank Baldwin, agent of the Limerick Mills, Limerick, Me., has resigned to accept a position as superintendent of the Edward T. Steel & Co., Bristol, Pa.

Joseph Knight has accepted the position as overseer of carding at the Verd Mont Mills Co., Ludlow, Vt. He comes from Bridgton, Me.

William Grandage, overseer of dyeing for Joseph Greer, Emerald Mills, Philadelphia, Pa., has severed his connection with that company and is succeeded by John Burrans, who has been salesman for I. Levinstein & Co., Boston.

John Archer has accepted the position as overseer of spinning at the Ray Mills, American Woolen Co., Franklin, Mass.

Harry Warrington, overseer of the beaming department at the Kerr Mill, Fall River, Mass., has resigned that position after a number of years with this concern.

Douglas Anderson, overseer of dyeing at the Wyandotte Worsted Co., Waterville, Me., has resigned to accept a similar position with the Talbot Mills, North Billerica, Mass.

Sidney Reed David, representing F. E. Atteaux & Co., Boston, Mass., is representing this company through Rhode Island as well as through the State of Maine.

Albert W. Dimmick has been appointed assistant treasurer of the Grosvenordale Co., North Grosvenordale, Conn. He was formerly agent of the Fisher Mfg. Co., Fisherville, Mass.

John R. Edwards has accepted the position as overseer of dyeing for Hall, Gardiner, Jr. & Co., South Willington, Conn. He comes from Lowell, Mass.

George F. Edson has accepted the position as overseer of finishing at the Bay State Mill, American Woolen Co., Lowell, Mass., on the night force. He comes from Bennington, Vt.

DEATHS.

M. Robert Dewstoe, president of the Nims Mfg. Co., Mt. Holly, N. C., died at his home, February 21. He was a native of Dubuque, Ia., and was one of the promoters of the Albion Mfg. Co., and the Nims Mfg. Co. was organized under his direction. He is survived by a widow, two sons and two daughters.

Otto Weiss, superintendent of dyeing at the Botany Worsted Mills, Passaic, N. J., died at the age of 62 years. He had been 25 years in their employ.

Henry Wilde, superintendent of the weaving department of the Brainerd & Armstrong Co., New London, Conn., has severed his connection with that company and is now traveling in the South. It is rumored on his return that he will engage in the silk business.

William B. Weeden, for more than half a century in the woolen business in Rhode Island, died at his home in Providence from a paralytic shock. Mr. Weeden was born in Bristol, Sept. 1, 1834, and was a member of the firm of Taft & Weeden Co., which operated the Weybosset Mill at Providence. He was also a member of the Common Council in 1882-1883 and a member of the R. I. and Mass. Historical Association. Mr. Weeden had been agent of the Manton Mill, American Woolen Co., Manton, R. I., for a number of years. Six children survive him.

William V. Parker, of the firm of Charles Chipman's Sons, 88 Leonard St., New York City, died on Monday, February 26, at the age of 46 years. Mr. Parker was born Feb. 12, 1866, at Germantown, Philadelphia, Pa. He was the son of Joseph Parker, a prominent business man of that place. He was a graduate of the Germantown Academy, under the present Professor Kershaw, and married Miss Elizabeth V. Chipman, the oldest daughter of Charles Chipman, and admitted to an interest in the business. Mr. Parker was very prominent with all the wholesale dry goods houses throughout the country, commanding a large trade by his well known integrity and square dealing.

Frederick Wicks, for 33 years employed at the Atlantic Mills, Providence, R. I., and for several years chief clerk there, died at his home at 457 Plainfield St. in that city of pneumonia, at the age of 47 years.

James Holroyd, a prominent business man of Albany, N. Y., and one of the best known manufacturers in this section of the State, died March 21, at his home, 182 Washington Ave., at the age of 74 years. In 1878 he opened a mill on Hudson Ave., Albany, and this proved to be one of the most successfull enterprises of its kind in the country. The line of underwear which he manufactured was known all over the world. He retired in 1901. He is survived by a widow, a sister and one brother.

Samuel Farrer, better known as "the grand old man" of Kensington, Philadelphia, Pa., died on Saturday, March 2, at his home in that city. Mr. Farrer was born in Yorkshire, Eng., Nov. 7, 1815, came to the United States in 1857 and worked at his trade as wool sorter, retiring several years ago. He is survived by one daughter and one son.

Edward M. Temple, for forty years paymaster at the Jackson Co., Nashua, N. H., widely known as a musician and founder of the Nashua Oratorio Society, died at the Nashua Emergency Hospital, March 3. He had been in ill health for several months and his death was not wholly unexpected.

Thomas Martin, treasurer of the T. Martin & Bro. Mfg. Co., of Chelsea, Mass., died March 7 after a few months' illness. He was born in Leicestershire, Eng., and started manufacturing elastic fabrics at Easthampton, Mass. He afterwards moved to Chelsea and became superintendent of the Boston Fabric Co. Later he with his brother, William, engaged in the narrow elastic webbing business. He was president of the First National Bank of Chelsea and a trustee of the Chelsea Savings Bank. He is survived by a wife and two daughters.

John J. King, overseer of finishing at the Old Town Woolen Co., Old Town, Me., died on February 24, after a short illness of pneumonia.

Patrick Maxwell, for a number of years an overseer at the Hinsdale Woolen Co., Hinsdale, Mass., died recently at Philadelphia, after a brief illness.

Origen H. Merrick, assistant treasurer of the Merrick Thread Co., Holyoke, Mass., died at his home in Brookline, Mass., after a few weeks' illness of Pneumonia. Mr. Merrick was born in Willington, Conn., March 7, 1854. His father, Timothy Mooney, was founder of the Merrick Thread Co. Mr. Merrick was a graduate of the Williston Seminary in 1872 and of the Brown University, class of '76. He was a member of the Second Baptist Church of Holyoke, and for a number of years was a director of the Home Market Club. He retired from business about five years ago and moved to Brookline, Mass., from Holyoke. He is survived by a widow and two sons.

Orville Macomber, superintendent of the Winthrop Cotton Yarn Co., Taunton, Mass., died at his home at the age of 50 years. He was a member of a number of organizations and is survived by a wife and two daughters.

Lucius H. Corey, overseer of spinning at the Bailey Knitting Mills, Fort Plain, N. Y., died February 19 at his home in Fort Plain of apoplexy and Bright's disease. Mr. Corey was a member of the National Association of Woolen and Worsted Overseers, also a member of the beneficiary department. He was highly respected by all who knew him.

Daniel Sheehan, for a number of years overseer of weaving at the Russell Mfg. Co., Pittsfield, Mass., died at the Hill Crest hospital in that city, after a long illness, at the age of 62 years. He is survived by a widow, one brother and one sister.

Mill News

Those interested in receiving early and more complete investigated information of projected new mills, enlargements, improvements, fires, facts and gossip of the trade are referred to the TEXTILE ADVANCE NEWS, issued weekly by the publishers of the TEXTILE WORLD RECORD, at $15.00 per year.

COTTON.

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New Mills.

*Arkansas, Camden. Parties interested in the establishment of a cotton mill here, as reported recently, state that it is not likely that their organization will be completed for some weeks yet. They are desirous of getting an experienced textile man to become associated with them and look after the operating end. They report that local conditions are very favorable to the establishment of an enterprise of this sort.

North Carolina, Rhodhiss. The E. A. Smith Mfg. Co. will be located at Rhodhiss, and construction work will be started about May 1. A mill for making heavy drills and sheetings with capacity of 15,000 ring spindles and 400 looms, to be driven by water power, will be built and equipped. This concern was incorporated in January with a capital stock of $300,000 and later organized with E. A. Smith as president and treasurer. About the same time Mr. Smith disposed of his interests in the Chadwick-Hoskins Co. of Charlotte and resigned as president. More recently he purchased the holdings of the Hiss Estate in the Rhodhiss Mfg. Co. and is active in the management of the plant. J. W. Kidd will be superintendent of the new mill and the product will be sold by Wilson & Bradbury, of Phialdelphia and New York, who are also selling agents for the Rhodhiss Mfg. Co.

Rhode Island, Westerly. Fred E. Fowler, secretary of the I. E. Palmer Co., Middletown, Conn., will leave that concern on April 1 and manufacture mosquito netting in the Main St. Mill, doing weaving, dyeing, bleaching and finishing. A company will be formed and will probably be known as the Westerly Textile Co. Mr. Fowler will be located here at the mill after May 1 and expects to start operations about July 1.

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Enlargements and Improvements.

Alabama, Eufaula. It is reported that the Cowikee Mills will erect a building to house an installation of 8,000 additional spindles. This concern has a capital of $100,000 and manufactures fine chambrays on a present equipment of 12,300 spindles and 320 looms.

Alabama, Huntsville. Raw stock dyeing equipment has been added to the dyeing department of the Lowe Mfg. Co. Ginghams, madras shirtings and chambrays are manufactured on 27,000 ring spindles and 500 looms. Ralph P. Hamilton is superintendent.

Alabama, Sylacauga. The machinery of the Central Mills is being overhauled and repaired and it is reported that additional equipment may be added. 18s to 30s hosiery yarns are the product of 26,000 ring spindles.

Canada, Nova Scotia, Yarmouth. It is reported that the Cosmos Cotton Co. will erect an addition during the summer which will about double its capacity and in this connection has asked for certain concessions in the matter of taxes, etc. The company manufactures cotton duck, felts and twines with present equipment of 11,200 ring and 3,094 twisting spindles, 47 broad and 50 narrow looms, selling through the J. Spencer Turner Co. of New York.

Connecticut, Killingly. Fifty new fancy looms are to be installed by the Attawaugan Co. in the next few months to replace old looms now in use. C. H. Truesdell, the superintendent and buyer, advises that no other changes are contemplated just now.

*Georgia, Athens. New machinery to replace old equipment has been shipped to the Mallison Braided Cord Co. as follows: 12-40 in. new revolving top flat cards, 1 finisher picker, and 4 spinning frames, 216 spindles each.

Georgia, Columbus. Before summer the local plant of the Bibb Mfg. Co. is to be enlarged by the erection of an addition, 212 ft. long by 100 ft. wide. This annex is expected to be in full operation by July 15. Some of the departments have been operated overtime recently.

*Georgia, Lagrange. At the Lagrange Mills of the Consolidated Cotton Duck Co. a full equipment of 5,000 spindles has been taken out and is being replaced with the same quantity of new machinery. They are also putting up a separate cotton opening house with space sufficient for the installation of garnett machines. These changes will bring the mill up-to-date in every particular.

Georgia, Newnan. According to report, the McIntosh Mills, manufacturers of cotton yarns, with present equipment of 10,000 spindles, will add considerable new machinery, including revolving flat-top cards, spinning frames and spoolers, and are inquiring for prices.

*Maryland, Baltimore. Wm. E. Hooper & Sons Co. has awarded contract to Henry Smith & Sons Co. of Baltimore, to erect the new 4-story brick mill, plans of which were given recently.

Maryland, Baltimore. The Consolidated Cotton Duck Co. is reported to be planning a large addition to one of its plants in the vicinity of Baltimore.

*Massachusetts, Chicopee. Work is being completed on the new mill of the Dwight Mfg. Co. on which work was started nearly a year ago.

Massachusetts, Chicopee Falls. No. 5 Mill of the Chicopee Mfg. Co., now used mainly for warping and slashing, is to be equipped with about 24,-

000 spindles. The warping machinery is already being moved to the basement of Mill No. 1.

Massachusetts, Fall River. Several spinning frames and twisters have recently been installed by the Annawan Mills, Inc., for the manufacture of coarse yarns, a more ready sale for the lower grades of waste having been found in this form.

Massachusetts, Fitchburg. The Parkhill Mfg. Co. has awarded contract for the construction of a new storehouse at Mill A to the Chas. B. Maguire Co. of Providence. Work will be started at once. The new building will be 4 stories high, 100 by 137 ft., of brick. No further changes are to be made.

*Mississippi, Meridian. The Lauderdale Cotton Mills, successors of the Meridian Cotton Mills, are reported as making extensive improvements, including additions to the card room, installation of electrical equipment for the operation of looms and remodeling of the dyeing plant. When this work is completed, it is stated that the plant will be started on full time, giving employment to about 300.

North Carolina, Albemarle. According to report, the Wiscassett Mills Co. will build an addition in which machinery will be installed for the spinning of their card strips and combed waste into coarse yarns. The company has a capital stock of $500,000 and an equipment at present of 70,000 spindles operating on cotton yarns, and 500 latch needle knitting machines for the manufacture of women's seamless and children's cotton hosiery.

North Carolina, Bessemer City. It is reported the Atlas Mfg. Co. will shortly award contracts for an additional building for a weave room on account of increasing business.

North Carolina, Cornelius. The Gem Yarn Mills have purchased a 200 horse-power engine, to replace one of smaller capacity.

North Carolina, Granite Falls. The Granite Falls Mfg. Co. is planning the addition of another story to its main mill building by which the capacity will be increased about 75 per cent. The company manufactures carpet warps. Orders for the additional machinery have already been placed.

North Carolina, Kannapolis. In order to utilize the waste products of the various mills in which J. W. Cannon is interested, the Cannon Mfg. Co., whose main plant is at Concord, has awarded contract for a large three-story mill building and a brick warehouse. A further increase is to be made in the local branch by the addition of 5,000 spindles, which will give a total equipment of 35,000 spindles.

*North Carolina, Lincolnton. The new Rolin Mfg. Co. has organized with H. S. Robinson as president and treasurer and J. L. Lineberger, secretary and manager. The old Piedmont Cotton Mills have been taken over and will be improved by the installation of a $2,500 steam plant, 2,300 spindles and 2 knitting machines.

North Carolina, Lowell. It is reported that contract has been awarded by the Lowell Cotton Mills for 5,000 new spindles. The company has been operating 13,500 spindles operated by steam and electricity in the manufacture of cotton yarns.

North Carolina, Lowell. The Peerless Mfg. Co., makers of combed yarns on 5,000 ring spindles, have placed an order for two new spinning frames.

North Carolina, Monbo. The spinning department of the Turner Mills Co. is being overhauled and the output will be increased. Pierce Gault is in charge of the work.

North Carolina, Roanoke Rapids. An enlargement will be built for the Rosemary Mfg. Co. to provide space for additional looms and building contract has been awarded to T. C. Thompson & Bro. of Birmingham, Ala. Sixteen cottages for operatives also will be constructed. About $25,000 is to be expended on these improvements.

*Rhode Island, Providence. The work of excavating for the new weave shed to be erected as an annex to the Interlaken Mills at Harris, will be started shortly by the Prindeville Co., the concern which has the contract. The work of removing several of the tenements to make room for the new building is under way. Detailed report of this enlargement has been given previously.

Rhode Island, Riverpoint. Plans for the installing of automatic looms in the Valley Queen Mill of B. B. & R. Knight has been completed and it is expected this work will be begun in the near future.

Rhode Island, Warren. A 4-story mill building, owned by the Cutler Mfg. Co., which has been idle since the reorganization will be started up on novelties. At this date no information can be given as to the lines that will be made or the date on which operations will be started. Good progress is being made on the preparations to improve the power department.

South Carolina, Batesburg. There are good prospects of an early increase in the equipment of the Middleburg Mills, expected since early in 1911, when it was voted to increase the capital stock from $200,000 to $300,000. It is said the company is negotiating for equipment which will increase the present output about 50 per cent. Tickings and shirtings are manufactured on 10,000 ring spindles and 310 looms.

South Carolina, Cateechee. An enlargement of the power dam and the installation of a hydro-electric plant of sufficient capacity to furnish electric power throughout the mill, are contemplated by the Norris Cotton Mills Co., manufacturers of converters' goods on 18,288 spindles and 452 broad looms

South Carolina, Darlington. The Darlington Mfg. Co. are reported as preparing to replace old style looms with improved automatic machinery. The company has a present equipment of 864 broad and 60 narrow looms running on print cloths, sateens and fancy shirtings.

*South Carolina, Easley. The new mill of the Glenwood Cotton Mills, mentioned in last issue, will be of 20,000-spindle capacity, and it is said that the contracts for machinery have been placed. J. E. Sirrine, of Greenville, is the engineer,

South Carolina, Greenville. The Monaghan Mills, recently reported as installing 80 wide looms for the manufacture of a special product, have placed orders for ten additional spinning frames.

South Carolina, Greenville. The Camperdown Mills will make an addition of 3,000 spindles to their present equipment some time during the summer They now have 10,624 spindles and 512 looms on ginghams and chambrays.

*South Carolina, Greer. The work of setting up 450 automatic looms equipped with dobby heads has just been completed in the addition built during 1911 for the Greers Mfg. Co. These looms are running on fancy shirtings.

South Carolina, Seneca. Extensive improvements at the plant of the Seneca Cotton Mills of the Parker Cotton Mills Co. to be made during the present year include an extension at the northern end of the present main building and the erection at the southern end of a separate one-story building to be used as a picker room, the laps to be conveyed to the card room on the third floor by means of an elevator. The equipment, it is said, will be increased to 30,000 spindles and 1,000 looms and a new engine and boilers will be installed to supply power to the weave room, the present power plant to be used for the balance of the mill.

South Carolina, Walhalla. On account of a change to a finer line of goods, the Walhalla Cotton Mills will make additions to the equipment of the card and weave rooms. It is not thought that any addition to the spinning room machinery will be necessary. This mill of the Parker Cotton Mills Co. of Greenville has been making prints and sheetings on an equipment of 18,816 spindles, 340 broad and 170 narrow looms.

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Mills Starting Up.

*Alabama, Selma. Necessary repair work around the Helen Cotton Mills, formerly the Cawthon Cotton Mill, is being carried on as rapidly as possible and the new owners are advertising for help. At the recent sale of the property it was purchased by J. F. Ames, 5605 Euclid Ave., Cleveland, O., for $70,000. James S. Bradbury is one of the men interested in the new company.

Georgia, Griffin. The Georgia Cotton Mills, the new concern which took over the Spalding, Central and Boyd-Mangham Mills, will soon put the Boyd-Mangham plant in operation. The Spalding Mill will not be started up until extensive improvements can be made and the Central Mill will not be operated until the Georgia Power Co. can extend its lines from Atlanta to Griffin.

North Carolina, Dallas. The Dorothy Mfg. Co. has been incorporated with an authorized capital stock of $250,000 to manufacture and sell cotton yarns, cloth, etc., by S. M. Robinson, J. C. Rankin and S. E. Mason. It is reported that this company will take over and operate the Dallas Cotton Mills.

*North Carolina, Stubbs. In about thirty days the plant of the old Buffalo Mfg. Co. will be started up by a new corporation the organization of which is to be perfected during March. The plant will be started on 2/30s yarns, but is equipped to make up to 2/40s. Z. C. Mauney of Shelby will be manager. Other men interested are C. C. Blanton, A. H. Cline and J. L. Mull, who bought the property at the sale held several months ago.

South Carolina, Chester. Operations have been resumed in the Wylie Mill after an idleness of several months in which a new weave shed was constructed and 640 looms installed.

WOOLEN.

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New Mills.

Connecticut, Shelton. A concern known as the Derby Worsted Co. has been incorporated with capital stock of $27,000 to manufacture ladies' dress goods in Shelton. The work of getting out samples was started last October under the firm name of the R. & H. Mfg. Co. and they expect to operate 50 looms, selling the product direct. Harry D. Hewett is president, superintendent and buyer, and A. Novitzky is treasurer. The office is located at 16 Olivia St., Derby, Conn. Since October the business has been carried on in a small way in Derby, and probably the increase to the proposed capacity of 50 looms will be made very soon. The goods will be dyed and finished elsewhere.

*New Jersey, Rochelle Park. The Saddle River Worsted Mills Co., incorporated several weeks ago with capital stock of $250,000, will begin the construction of a mill in April. Rafael L. Lindell, the president, expects to begin manufacturing in November or December. White flannels and dress goods will be made on equipment of 100 looms and finishing equipment and employment will be given to about 120 hands. Steam power will be used. An office has been opened in the Prudential Bldg. in Newark. In addition to Mr. Lindell, whose address is 40 Wall St., N. Y., T. S. Jevons and Howard B. Major, both of New York, are interested.

Tennessee, Harriman. The Harriman Riverside Woolen Mills, the new concern which has taken over the Harriman Knitting Mills and will equip them for making woolen yarns, jeans, cassimeres and dress goods, is really a branch of the Riverside Woolen Mills of Knoxville. Two sets of cards, 24 narrow and 12 broad looms will be operated and it is expected operations will be started by the first of May. The plant will contain a dye house and steam and electric power equipment. W. T. Parham of Knoxville, is president; C. E. Hendrick of Harriman, vice-president; B. O. Whittle of Harriman, secretary; J. Y. Lee of Harriman, treasurer, and Ed. F. Parham, superintendent and buyer. Work has been started on a brick addition which will better adapt the old knitting plant to the manufacture of woolen goods.

Virginia, Laurel Mills. The Rappahannock Woolen Mills Co. has decided to go ahead with the work for the rebuilding of the plant destroyed by fire in 1911 and has awarded contract to J. E. Russell of Marshall, Va., for the construction of a building. Fred S. Hinds of Boston prepared the plans and specifications. The new mill will

be of brick and cement, 51 by 77 ft. About three months will be required for the completion of the building and complete equipment for a 1-set cloth mill will be installed.

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Enlargements and Improvements.

Massachusetts, Amesbury. Four sets of cards have been installed in the plant of the Merrimac Hat Co. and four or six additional sets will be added shortly.

*Massachusetts, Franklin. A Rhode Island construction company has the contract for the erection of a building for the American Felt Co. which it is said will be used as a picker house. The company was recently reported as having purchased a small piee of land adjacent to its plant.

*Massachusetts, Globe Village. Plans for the new finishing mill being erected for the Hamilton Woolen Co have been changed so as to provide for a building six stories high instead of five.

Massachusetts, Millbury. Molt Bros., Inc., custom wool scouring, dyeing, picking, carding, etc., are running until ten o'clock at night to keep up with orders. It is reported that while nothing definite has been decided, plans are under consideration for the enlargement of the plant.

Massachusetts, Webster. Five sets of woolen cards purchased by the Merritt Woolen Co. at the sale of the assets of E. Kenyon & Son, Kenyon, R. I., are being shipped here and will be added to the company's present equipment, increasing same to eight sets and 18 looms.

Massachusetts, Worcester. A permit has been issued for the Darling Mfg. Co. to make alterations in its plant. The E. J. Cross Co. has the contract.

Missouri, California. The California Woolen Mills Co. are adding another set of cards, to be followed by the accompanying equipment of spindles and looms. The plant has been running on a line of cassimeres.

Pennsylvania, Philadelphia. Carl Grubnau & Son, in addition to increasing the equipment of their scouring and combing plant at 2d and Erie Ave., to 6 cards and 5 combs, have also installed a large new engine. It is also probable that a large new addition to the present plant will be erected at a later date.

Pennsylvania, Philadelphia. The Lehigh Spinning Co., Jasper and Adams Sts., with John Haney, proprietor, and John Moffett, superintendent, operating 3 sets cards and 1,600 mule spindles on woolen and merino yarns for weaving and knitting, 5s to 60 cut, report that it is their intention within a short time to add 1,040 additional spindles to enable them to keep up with their orders.

Pennsylvania, Philadelphia. The new four story addition to the Andrews Mills at Leiper St. and Adams Ave. having been completed the company is now installing 60 additional looms, bringing their equipment up to 220 looms, all of which are reported as running full time. They manufacture worsted dress goods and men's wear.

Vermont, Winooski. A 1700 h. p. turbine engine is being installed in the new engine house of the Burlington Mill (American Woolen Co.). Recently ten boilers were set This new power department will be used for auxiliary power when the water power is low.

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Mills Starting Up.

*New Hampshire, Penacook. The company which has taken over the plant of the Concord Mfg. Co., the sale of which was recently reported, will begin operations in about a week, with W. F. Shaw, formerly superintendent of the Assawaga Co. at Killingly, Conn., as manager. A line of woolen goods, cloakings and suitings will be manufactured.

Rhode Island, Providence. Material is being shipped to the Elston Worsted Mills from the Cleveland Worsted Mills Co. of Cleveland, O., the new owners, and a quantity of tops and warps have been received. Work will be resumed under the new management about April 1. There is plenty of space for enlargements and if the plant is as successful as other Cleveland Worsted Co. properties, it will be increased at no very distant period.

KNIT.

New Mills.

*Maine, Lewiston. The Jutras All-Wool Knitting Co., recently reported incorporated with a capital stock of $5,000, will manufacture men's, women's and children's wool stockings. J. M. O. Herbert is president and P. C. Jutras, treasurer and superintendent, and with Mr. Herbert will attend to the buying. The company intends to sell direct and states that they are now in the market for knitting machinery. They expect to start about April 1st with one or two machines.

*Massachusetts, East Douglas. A site has finally been decided upon by the Tally-ho Knitting Co., and negotiations have been completed for a piece of land on Mechanic St. formerly owned by the American Axe & Tool Co. Chas. E. Batcheller is quoted as saying that the land purchased is 75 feet wide and 400 feet deep and that plans will be prepared at once for a mill suitable for the company's purposes. The purchase price is not given. The Taliy-ho Knitting Co. was organized several months ago to manufacture a high grade line of sweaters and located temporarily in the loft over the town pumping station while a building for its use was being constructed. Later a disagreement arose with the owner of the proposed mill property and it was decided by the company to erect a mill of its own. Ernest Wye is the manager.

New York, New York City. The Ballow Braid Co., 321 W. 13th St., A. W. Ballow, president and treasurer, manufacturers of trimmings and braids, are reported as having installed 40 knitting machines for the making of silk knit neckties.

North Carolina, Robersonville. The Robersonville-Tar River Hosiery Mills have been incorporated with a capital stock of $125,000 and the following officers: J. H. Roberson, president;

F. W. Ayers, vice-president; A. E. Smith, treasurer, and J. T. Lewis, agent, superintendent and buyer. This is a consolidation of the Robersonville Hosiery Mfg. Co., of Robersonville, and the Tar River Hosiery Mills of Washington, N. C. Production will begin in about 60 days in a building already completed. Women's and children's hosiery will be manufactured on 85 knitting and 2 sewing machines, employing 50 hands. The product will be sold through Harry T. Stuart, New York.

Pennsylvania, Philadelphia. The Commercial Knitting Mills at 1666 Oxford St., Frankford, is the name of a new concern just starting up in the manufacture of high grade silk knitted neckwear. Four knitters have already been installed, with 24 others to follow within a short time. The production will be sold direct.

Pennsylvania, Philadelphia. Berman Cohen, at 208 South 3rd St., has started up a plant for the manufacture of silk neckwear, five machines having already been installed, together with a sewing machine. He sells direct.

*North Carolina, Hendersonville. The Freeze Hosiery Mills Co. has been organized with capital stock of $25,000 to establish a knitting plant with daily capacity of 240 dozen pairs of hosiery. Contract has been awarded for the erection of a brick and stone building, 50 by 100 ft., and 40 knitting machines, electrical power equipment and dyeing plant are to be installed. R. P. Freeze, treasurer of the Fidelity Hosiery Mills of Newton, who has been reported previously as interested in this project is secretary and treasurer of the new company and is in charge of arrangements.

Pennsylvania, Philadelphia. Stein & Sondheimer, who recently started up a plant at 112-14 N. 12th St., for the manufacture of knitted neckwear, are operating under the name of the Owl Knitting Mills with an equipment of 15 knitters and 1 sewing machine, the plant being operated by electric power. Chas. P. Cerin is the superintendent and I. Stein, buyer. They are using silk and mercerized yarns in skeins.

Pennsylvania, Reading. Light & Green are equipping part of the building at 220 Buttonwood St. with 30 knitters, 3 loopers and 3 ribbers on which they will manufacture ladies' boot silk hosiery and 176-needle Maco foot hosiery and half hose. They will buy 2/50s cotton and 5-thread silk.

*Pennsylvania, Sharon. R. H. Schell Co. has been incorporated with capital stock of $12,000 to manufacture knit goods, half hose, sweaters, shirts, caps, etc. R. M. Schell of South Sharon, Nicholas Mehler of Sharpsville, and Patrick Moriarty of Sharon, are the incorporators. Previous reports of this project have been given.

*Rhode Island, Woonsocket. According to report, the Gold Mark Knitting Co., recently reported organized to manufacture jerseys, sweaters, bathing suits and knit novelties, has engaged quarters on Railroad St. and will begin at once to install machinery.

Wisconsin, Merrill. It is now reported that the establishment of a knitting mill here is practically assured. A company capitalized at $10,000, employing about twenty hands at the start and manufacturing sweaters, hosiery, knit ties, fancy knit goods, etc., will probably be organized. A rug manufacturing concern and a woolen mill have also been reported as to locate here within the past few months.

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Enlargements and Improvements.

California, San Francisco. To meet the demand of their increased business the Sunset Knitting Co. has removed to larger and better quarters at 334 Sutter St, between Grant Ave. and Stockton St.

Canada, Ontario, Paris. The Ellis Underwear Co. of Hamilton is to be brought to Paris, and combined with Penmans, Ltd., making a line of high grade spring needle goods. As previously reported, the property occupied by the Ellis Company at Hamilton, where men's and women's ribbed underwear and union suits were manufactured on 20 spring needle and 30 sewing machines, was purchased last December by C. J. Myles. A. C. Marsh will be manager of this department at Penmans.

*Connecticut, Addison. The additions to the plant of the Glastonbury Knitting Co., manufacturers of men's flat underwear, will be of brick mill construction, two stories high, one 40 by 45 feet, and the other 32 by 56 feet, steam heated and lighted by electricity. This will give additional room in four departments and provide for an increase in production of 25 dozen per day. Orders for machinery have been placed. C. F. Dean of Glastonbury has the building contract.

Connecticut, Shelton. A department for the manufacture of paper boxes is being established at the plant of Radcliffe Bros., Inc.

Connecticut, Winsted. A new addition, 4 stories high, 39 by 65 ft., is being built for the Winsted Hosiery Co., manufacturers of men's flat underwear and seamless half hose, and will be used as an addition to the picking and spinning departments.

Illinois, Rockford. A 4-story mill is to be built for the Burson Knitting Co. on South Main St. at Cedar St., north of the company's present plant and adjoining it. Plans are under way and the cost is estimated at $30,000. It is proposed to begin work within a month. The addition will be of the same style as the present plant and will be constructed to carry additional stories which may be built on as the growth of the business requires. It is expected the company will occupy the addition in the fall. The Burson Knitting Co. manufactures ladies' full fashioned cotton hosiery, operating 1,400 knitting machines and 100 sewing machines and bleaches and finishes the product. Ralph Emerson is president; W. E. Hinchliff, treasurer, and E. J. Ziock, superintendent.

Massachusetts, Needham Heights. A new addition to the knitting mill of Roper Bros. Co. has been completed. Athletic knit goods, sweaters, etc., are manufactured.

*Massachusetts, New Bedford. No preparations have been made as yet by the Mishaum Knitting Mills for the construction of the building on the land recently purchased, as noted in an earlier issue, and details of the operation cannot be given. It is known that a steam boiler and two dyeing machines will be required. This concern operates a small plant on men's and women's seamless cotton and silk hosiery.

*Michigan, Alpena. Six new power sewing machines are being added by the Alpena Woolen Mills, and two new knitting machines and two looms are to be installed. D. D. Hanover is president and buyer, R. H. Rayburn, treasurer, and John Neilson, superintendent.

*Michigan, Bay City. Production of goods will be begun by the Vassar Knitting Mills in their new quarters in this city about the first of April, with enlarged equipment, which will include 40 knitting machines and 15 sewing machines. The plant will be operated by electric power and will make men's, women's and children's sweaters, mufflers, caps and fancy knit goods. It has been noted previously that the capital stock has been increased to $50,000, and recently officers were elected as follows: F. C. Hogle, president and buyer; F. D. Johnson, treasurer, and E. E. Reed, superintendent. A new department is to be installed for knitting jersey cloth just as soon as the equipment can be secured and set up. This concern is a reorganization of the Vassar Knitting Works which was located in Vassar, Mich., for a number of years; last fall, finding themselves cramped for want of factory facilities and capital, they removed the business to Bay City and formed a company with paid-up capital of $50,000; $25,000 of this is new capital, paid in cash, so that for some time at least they will be able to keep pace with their rapidly growing business.

*Minnesota, Minneapolis. Improvements begun last fall at the plant of the Northwestern Knitting Co. are nearing completion, and work will soon be begun on further additions, upon completion of which the company's buildings will cover the entire block bounded by Western, Lyndale, Aldrich and Third Aves. Another five-story building for office and warehouse purposes and the addition of two stories to present buildings are included in the plans, which it is reported call for an expenditure of about $150,000.

New York, Granville. It is understood the Clark Textile Co. of Saratoga Springs is increasing the local branch and that more power equipment is required.

New York, Little Falls. The Gilbert Knitting Co. have under contemplation the raising of one of their buildings two stories, to give increased storage space. This matter has not been determined definitely.

*New York, Niagara Falls. The 2-story concrete addition for the Visor Knitting Co. will be finished about May 1. Six new knitting machines have been ordered and about 25 additional hands will be employed when the new department is running. The company manufactures sweater coats entirely.

North Carolina, High Point. It is reported that the Durham Hosiery Mills will erect an addition to their No. 3 Mill, to be of brick, three stories high, with a 150-foot front. The company's High Point branch has an equipment of 167 latch needle knitting machines and 26 ribbers, with dyeing and finishing machinery, operated by electricity, and the new building will about double the capacity.

*Ohio, Cleveland. N. J. Rich & Co., whose new quarters at Euclid Ave. and E. 61st St. were equipped during the winter, are now operating 8 spring needle, 125 latch needle and 360 flat knitting machines and 150 sewing machines by electric power on eiderdowns, fleece linings, sweater coats, fancy knit goods, etc., employing 1,000 hands. The new mill has four acres of floor space and capacity of 3,000 dozen daily.

Ohio, Piqua. An increase has been made in the capital stock of the Piqua Hosiery Co. from $50,000 to $75,000 to provide for the equipment of the new plant that is now being constructed and will be completed within a few weeks. There is no change in the officers of the new company, who are W. K. Leonard, president; J. W. Daniels, vice-president, and F. M. Shipley, treasurer and buyer.

Ohio, Toledo. The capital stock of the Dolphin Hosiery Co. has been increased to $50,000 and an increase will be made in the plant. The equipment consists of 25 knitters operated on men's half hose, cotton, mercerized and silk. F. G. Gould has been elected president and among the directors are Anthony Lauer, John A. Vonricht, Edward Lauer, James Forrester, Wm. Lauer and Chas. W. Burke.

Pennsylvania, Bechtelsville. The Kutz Knitting Mill, containing 84 knitters and 8 sewing machines, on which they manufacture men's and women's seamless cotton hosiery, will be enlarged by the installation of 50 new knitters, which are now being delivered and set up.

Pennsylvania, Bloomsburg. The Bloomsburg Hosiery Mills are being operated to full capacity and some new equipment is being installed.

Pennsylvania, Boyertown. It is reported that the United Underwear Mills, manufacturers of children's underwear, is being enlarged and greatly improved with the result that a larger working force will be necessary to conduct their future operations.

Pennsylvania, Philadelphia. S. Portner, recently reported as commencing the manufacture of knitted neckties at 257 Market St., has taken the floor above in addition to his original quarters and has ordered four more knitting machines to be used on the same line of goods.

Pennsylvania, Philadelphia. Ten new knitting machines have been ordered by the Modern Knitting Mills, 18 N. 4th St., and will be used for manufacturing silk knitted ties.

Pennsylvania, Philadelphia. Additional knitting machines have been ordered by the Laurel Knitting Co., 73 Laurel St. They report an increase in

business on knitted silk ties and have been operating overtime to keep up with the orders on hand.

Pennsylvania, Philadelphia. T. P. McCutcheon & Bro. are adding a number of knitting machines to their plant at 249 Collom St. They make a specialty of knitted silk ties.

Pennsylvania, Pottsville. M. M. Donohue who recently enlarged his knitting mills at 701 N. 2d St., has purchased 18 new body frames which are now being set up and made ready for manufacturing women's, misses' and children's cotton underwear.

*Tennessee, Nashville. The addition to the plant of the May Hosiery Mills with its equipment of 78 knitting machines for manufacturing ladies' hosiery will constitute a new department in addition to the line of children's hosiery the company has been making.

*West Virginia, Martinsburg. It is reported that plans are being prepared for a new building at the Interwoven Mills of the Kilbourn Knitting Machine Co. This company was reported in January as stating that they were not yet ready to give information regarding large improvements which were contemplated.

Wisconsin, Beaver Dam. The local branch of the Paramount Knitting Co. of Chicago is reported as having received a consignment of 60 automatic knitting machines which will be operated on the company's line of men's hose.

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Mills Starting Up.

*New York, Rome. Manufacturing has been started by the new Rome Knitting Co., incorporated last November. A plant has been equipped at 420 West Court St. Tyler S. Griffin is manager. Misses', boys' and children's ribbed two-piece underwear and union suits are being made.

SILK.

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New Mills.

*Connecticut, Middletown. V. H. Woodhouse of New York is president and M. H. Eldridge of New York is secretary and treasurer of the new Woodhouse Silk Co., recently incorporated to operate the mill formerly occupied by the York Silk Mfg. Co. The plant is being made ready to start up and it is expected manufacturing will be begun in about two weeks. It is said the new corporation has purchased the property, the price paid being $100,000.

Pennsylvania, Philadelphia. A new concern known as the Geo. F. Justice Co. have taken space at 454-456 N. 10th St., where a line of passementeries will be made. Harry Haase, formerly superintendent for Hensel, Colladay & Co., is interested.

Pennsylvania, Ridgway. According to reports, a silk mill to employ 100 people has been secured for Ridgway and a plant will be established on what is known as the Macauley property owned by the Ridgway Board of Trade. G. W. Sykes, president of the Sykes Woolen Mill of Reynoldsville, heads the project and Otto Hauber, also of Reynoldsville, will have charge of the plant here. A 1-story, brick mill is to be erected and 100 looms installed.

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Enlargements and Improvements.

Connecticut, Watertown. The M. Hemingway & Sons Silk Co., manufacturers of skein and spool silks, reported reorganized in January, H. Morton Merriman, president and treasurer, Geo. C. Perkins, vice-president, and Geo. A. Driggs, formerly president and treasurer of the American Pin Co., secretary, are removing part of their equipment to the company's Waterbury plant, preparatory to tearing down the old power house and dye works. A new building for this part of the work is being planned and work upon it will be started soon. It is the plan of the new owners to eventually house the business under one roof, but whether the new plant will be located in Watertown or Waterbury has not been decided, and will depend upon local conditions as to labor, taxes, freight rates, etc.

New Jersey, West Hoboken. Reiling & Schoen are making arrangements to build two additional stories on one of the buildings of their local plant. Four hundred looms are operated on silk goods and 40 looms on woolen goods.

*New York, North Tonawanda. The greater part of the machinery for the new addition to the plant of the Niagara Silk Mills will be imported and has already been ordered.

Pennsylvania, Allentown. The Progressive Silk Co., which was recently burned out, at South Bethlehem, has leased for 3 years the two upper floors in the building of Callahan & Meyers. Manufacturing will be started about March 15 This concern originally was located in Paterson.

Pennsylvania, Bath. The Bath Silk Co. has disposed of its small looms and will replace them with a more modern type. J. H. Frederick of Emaus, Pa., is the proprietor. The management reports bright prospects and is looking for additional employes.

Pennsylvania, York. The Souter Silk Mfg. Co., Inc., manufacturers of dress and tie silks, located at Monroe St. and Highland Ave., West York, expect to have their throwing plant in operation within the course of a few months. The machinery has been ordered for this department and will be started up as soon as it has been installed.

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Mills Shutting Down.

Pennsylvania, Philadelphia. Felton & Stott, who started up 30 braiders at 2024-26 N. 10th St., on which they manufactured cotton and mercerized braided fabrics, have disposed of their plant and gone out of business.

MISCELLANEOUS.

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New Mills.

California, Red Bluff. A company has been formed of prominent sheep men to construct a wool scouring plant and storage quarters under the

name of the Red Bluff Wool Scouring & Warehouse Co. A site has been selected at the corner of Madison and Elm Sts. The contract for building has been let, the specifications calling for a 2-story structure, 150 ft. long by 115 ft. wide, the first story to be of concrete and the second of wood. The contract requires that the building be finished in sixty days. It will be used at first only for a warehouse, but in the fall wool scouring machinery will be installed. The operation will cost about $16,000 for building and approximately $18,000 for machinery. A. H. McInnes has been elected president; P. O. Thomas, secretary, and Joseph Tait, treasurer.

New Jersey, Camden. The building at Cramer Hill, formerly operated by the John Lunn Co., for wool carbonizing and scouring, which was burned down two or three years ago, has been rebuilt and is now occupied by the Infallible Waterproofing Co., with John Lunn as president, the plant being equipped with machinery on which they are waterproofing textile fabrics.

New York, Auburn. A new concern known as the Auburn Thread & Twine Co., Inc., has been organized with a capital of $36,000 and the following officers: Harold L. Ferris, president; Charles H. Steel, treasurer and buyer, and William Acheson, superintendent. Work on a mill of 300 or 400 spindles will be started in a week or two, and it is expected to have the same ready for operation in July or August. Line and tow flax machinery will be operated by electric power, and they are in the market for card clothing, dyeing and bleaching materials, etc.

Pennsylvania, Philadelphia. The Standard Silk Winding Co., having leased a portion of the building at 1666 Oxford St., Frankford, are equipping it with machinery with which they will wind silk on commission, making a specialty of knitting silks.

Pennsylvania, Philadelphia. The Schwarzwaelder Co., refinishers and rainproofers of textile fabrics at 301-303 Cherry St., have started up a branch plant at 3630 Richmond St., where they have taken over a 2-story brick building which they have equipped with the latest improved machinery for rubberizing cloths, the plant having a capacity of 75,000 yards per week.

Pennsylvania, Reading. The Reading Bleach Works, of which Lesher & Smith are the proprietors, located at 3d and Bingamin Sts., is now well under way with plenty of work in hand. They are bleaching cotton piece goods, hosiery and skein yarns, with a capacity of 9,000 pounds per day. Harry L. Smith is the superintendent and A. B. Lesher, buyer.

*Pennsylvania, Spring City. The new bleaching concern reported in last issue as to begin business here is known as the Spring City Bleaching Works. S. C. Hottenstein, I. A. and H. J. Diener, all of Hamburg, Pa., are the members of the concern and the plant will be operated under the personal supervision of Mr. Hottenstein. Special attention will be paid to the bleaching of knit underwear and the plant is expected to be in operation about April 1.

*Rhode Island, Pawtucket. The Kingston Knit, Dye & Bleach Co., a new concern, expects to begin operations in about a week. They will do dyeing and bleaching of woolen and worsted yarns, braids, tapes, hosiery, webbings, etc. F. A. Morrill is president and Trubee Burrow, treasurer. The office and works are at 19 Charlton Ave., Pawtucket.

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Enlargements and Improvements.

Connecticut, Bridgeport. Work has just been started on an addition, 66 by 188 ft., to be 2 1/2 stories high, with tar and gravel roof, for Alb. and E. Henkels. Lace machines for making torchon laces will be installed. H. Albert Philips is the superintendent and buyer.

Kentucky, Covington. It is reported that owing to increased business the Reliance Textile & Dye Works, Inc., are making plans for the enlargement of their plant and that owing to local conditions it may be necessary for the company to remove to another location. This is a hundred thousand dollar corporation, dyeing and finishing cotton piece goods with a present capacity of ten tons per day.

Maryland, Baltimore. The W. & J. Knox Net & Twine Co. will build a new boiler house, 34 by 42 ft., and storage building of fire-proof construction.

Massachusetts, Lowell. It is reported that owing to increased business John C. Meyer & Co. are soon to make improvements, among which will be included new dyeing machinery. A new twisting machine of 150 spindles was recently installed and the company is employing 50 hands at present.

Massachusetts, Westboro. It is reported that the Mason Weaving Co. will build a weave shed on the land adjoining the old piano factory which they recently purchased, as noted. The goods stored in the old piano factory have been removed and the space will be used by the Mason Weaving Co. for storage and finishing purposes.

Missouri, St. Louis. The American Mfg. Co. of Brooklyn, N. Y., has purchased property on Soulard St. to be used for warehouse purposes, probably for the product of the St. Louis Cordage Co., which is a branch of the American Mfg. Co.

New Jersey, Paterson. The Peerless Plush Mfg. Co. have begun work on the addition of another story to their mill.

*New York, Minetto. Work will be started shortly on the new boiler house to be built for the Minetto-Meriden Co. The addition will be about 100 ft. square and the cost approximately $35,000.

Pennsylvania, Philadelphia. George Gray of the Frankford Bleachery, 4330-46 Factory St., Frankford, bleachers of cotton, woolen and silk fabrics, has in contemplation the installation of a plant for the purpose of bleaching and finishing white hosiery, with a capacity of 500 dozens per day.

Pennsylvania, Philadelphia. The Joynes-Campbell Co., incorporated about a year ago, have re-

moved their plant from 4th and Cherry Sts., in the center of the city, to the building at 1666 Oxford St., Frankford. They have increased their equipment and are manufacturing silk cords and tassels for the upholstery trade.

Pennsylvania, Philadelphia. D. Newman, now located at 5th and Market Sts., where he is manufacturing dress and cloak trimmings, silk cords, tassels, etc., reports that on account of the smallness of his present location he will soon remove to other quarters. The plant, which now contains 4 chenille machines, 7 braiders, 2 winders and other machinery used in this business, will be greatly enlarged by the installation of machinery of all kinds for making this grade of goods and a gas engine for the purpose of supplying the power. He buys cotton, mercerized, worsted and silk yarns.

Pennsylvania, Philadelphia. James F. Lynd, manufacturer of cords, gimps and chenilles at 429 N. Orianna St., has recently bought out the plant and equipment of D. C. Merklee, manufacturer of dress and cloak trimmings at 36 N. 4th St. Mr. Lynd has combined the equipments of the two plants at the latter address, where he will also make upholstery trimmings.

Pennsylvania, Philadelphia. A permit has been granted for the erection of an additional story to the dyeing and finishing plant of Richardson & Weir, located at Jasper and Westmoreland Sts.

Rhode Island, Central Falls. Improvements are contemplated by the Richardson Foster Co. to be made in the near future. This concern dyes, bleaches and finishes worsted tops and has been running overtime to get out the work on hand.

FIRES.

Alabama, Demopolis. The bleachery and 30 bales of cotton were destroyed by fire at the Elmore Cotton Mills. The loss is partly covered by insurance. Waste yarns, 3s to 5s, are manufactured on 4,000 mule spindles.

New York, Buffalo. Loss placed at $50,000 was caused by a fire in one of the buildings of the Buffalo Weaving & Belting Co., following an explosion of naptha.

New York, Cohoes. Considerable damage was caused by fire in the plant of the National Textile Mfg. Co., manufacturers of cotton batts, caused by some hard substance getting into a garnett machine. Some of the machinery was destroyed. The loss is fully covered by insurance.

Pennsylvania, Avoca. Fire destroyed the mills of the Avoca Silk Co. located in this town and a short distance from Pittston with loss estimated at $150,000, fully covered by insurance. A silk throwing business was conducted on 30,000 spindles. A definite decision has not been reached to build in Avoca, but the directors are understood to be favorable to remaining here and are considering plans for a more modern plant.

Pennsylvania, Philadelphia. Fire and smoke is responsible for a loss of about $1,000 to the plant of the Melrose Spinning Co., located at Howard and Berks Sts. They manufacture cotton carpet and upholstery yarns on 8 sets, 1,520 mule spindles. The fire is supposed to have been caused by sparks from a picker igniting a quantity of raw stock.

Pennsylvania, Philadelphia. A fire cause, it is presumed, by the dropping of sparks in a pile of waste slightly damaged the plant of Francis Kelley at 1724 N. Hancock St., manufacturer of cotton and woolen waste. The damaged portion of the plant will be repaired at once.

Pennsylvania, Philadelphia. Andrew Alexander's ingrain carpet plant, containing 16 looms, located in the Davenport Mills at Waterloo and York Sts., was recently damaged to the extent of $5,000 by fire which is said to have started through spontaneous combustion in a quantity of yarns. The damaged portions of the plant will be repaired at once.

Pennsylvania, Philadelphia. The 3-story brick building at 3213 and 3215 Frankford Ave., occupied by the Universal Dye Works and the Standard Hosiery Dyeing & Finishing Co., has been damaged by fire to the extent of $12,000. The damaged portions of the buildings are being repaired, with both companies continuing business as heretofore.

FACTS AND GOSSIP.

Alabama, Athens. The Fulton Cotton Mill Co. has been incorporated by T. M. Hobbs, C. E. Frost and J. W. Frost. This marks the completion of the reorganization of the Athens Cotton Mill Co. which has been proceeding for some time. At the recent sale the property was bid in for the stockholders by J. W. Frost for $30,185. The plant has been operated several months by C. E. Frost and T. M. Hobbs under the style of Hobbs & Frost. 2/24s cotton yarns are manufactured on 6,000 producing and 3,000 twisting spindles.

California, Los Angeles. A new concern known as the Pioneer Woolen Mfg. Co. is manufacturing worsteds at 1007 N. Main St. The plant is equipped for dyeing and finishing and sells through the Los Angeles Woolen Co. The capital stock is $20,000. Kelly Roth is president and buyer and I. Rosenberg, superintendent.

Connecticut, Danielson. Local mill men are reported as stating that the woolen mills at Dayville, Elmville and East Killingly are enjoying better business than at any time in recent years.

Connecticut, East Lyme. The Niantic Mfg. Co. are reported as very busy on their lines of dress goods and suitings, the carding and spinning departments being operated overtime every night except Saturday.

*Connecticut, Killingly. New machinery is expected to arrive for the Killingly Mfg. Co. next week. The additions are nearing completion and the mill will be manufacturing within two months. This company purchased the property of the old Williamsville Mfg. Co.

New Publications

(Any work noticed under this head can be obtained through the office of this journal.)

The "American Directory of the Knitting Trade" of the United States and Canada, for 1912; Lord & Nagle Co., 144 Congress St., Boston, Mass. Price $1.50.

The 1912 edition of this well-known book is the 30th year of its publication. It contains a full report of every knitting mill in the United States and Canada arranged alphabetically by states and towns; giving capitalization; names of the officers, including superintendent and buyer; kind of goods made; number of knitting machines, whether latch or spring needle; number of sewing machines; whether the mill dyes or bleaches or finishes; kind of power; number employed; selling agent; kind and sizes of yarn bought. Maps of the mill districts show the cities and towns where there are knitting mills. There is an index of manufacturers according to the kind of goods made, as well as an alphabetical index to the mills. One section of the book contains a list of manufacturers's selling agents and commission merchants handling knit goods, with the name of the person in charge of the Knit Goods Department. It also gives the names of the mills for which these concerns are special agents. There is a list of the dyers, bleachers, finishers, printers, etc., which make a specialty of knit goods. A directory of New York buyers of knit goods gives the names of the out-of-town firms for whom they buy. A very complete list of jobbers of knit goods and department stores are other valuable features. An index of machinery and supplies and yarn dealers supplying knitting yarn gives a ready reference index to manufacturers.

The "Knit Goods Trade"; Lord & Nagle Co., 144 Congress St., Boston, Mass. Price $1.00.

This book is a compilation of certain sections of the "American Directory of the Knitting Trade," containing manufacturer's selling agents, list of jobbers, and department stores, handling knit goods, large retailers, classified lists of manufacturers, showing kind of goods made, and the list of New York buyers for out-of-town concerns. The book is the pocket size with flexible covers. The jobbers' list has been greatly amplified in this edition and is by far the most extensive list of jobbers handling knit goods that has ever been published.

Twelve Principles of Efficiency; by Harrison Emerson; 423 pages, 5 by 7 1/4; The Engineering Magazine, New York.

In this volume the author continues the study of efficiency which he began in his earlier work, "Efficiency as a Basis for Operation and Wages." The third edition of the earlier work has recently appeared and has been revised so as to bring it into proper relation with the latest book, "Twelve Principles of Efficiency." The author deals with these principles in twelve chapters as follows: Organization and Principles the Prime Instruments for Efficiency; The Type of Organization Through which Efficiency is Attained; The First Principle: Clearly Defined Ideals; The Second Principle: Common Sense; The Third Principle: Competent Counsel; The Fourth Principle: Discipline; The Fifth Principle: The Fair Deal; The Sixth Principle: Reliable, Immediate and Adequate Records; The Seventh Principle: Despatching; The Eighth Principle; Standards and Schedules; The Ninth Principle: Standardized Conditions; The Tenth Principle: Standardized Operations; The Eleventh Principle: Written Standard-Practice Instructions; The Twelfth Principle: Efficiency Reward.

The Directory of the Textile World (Le Monde Textile); 7th edition, 1,260 pages, 5 by 9; A. Rey & Cie, 4 Rue Gentil, Lyon, France.

The 1912 edition of this directory has recently appeared and contains the same features as previous editions, the work having been carefully revised in order to bring it up to date. The following abstract of the table of contents shows the scope of the directory: France: Chambers of commerce; conditioning houses; manufacturers' associations; silk merchants; filatures; silk weavers; dealers in artificial silk, ramie and silk waste; cotton spinners; dealers in cotton yarn and waste; wool dealers, scourers, combers, spinners and dealers in wool yarn and waste; cloth manufacturers; silk, wool, cotton, etc.; cloth merchants; machine builders; dyeing, bleaching and finishing establishments. The directory covers the textile trade of France in a very complete manner and is also extended to include many foreign countries. The text is in French.

Efficiency as a Basis for Operation and Wages; by Harrington Emerson; 254 pages, 4 1/2 by 7 1/4, third edition; The Engineering Magazine, New York.

Since the first edition of this book appeared the question of efficiency has developed from a practically unknown subject to one that now claims attention in every branch of human endeavor. The author states that in the third edition he has recognized the rapid change of public sentiment by a searching revision and a considerable enlargement of the text, designed principally to emphasize certain points upon which experience has shown added emphasis to be necessary. The subject is considered in the third edition under the following heads: Typical Inefficiencies and Their Significance; National Efficiencies; The Strength and Weakness of Existing Systems of Organization; Line and Staff Organization in Industrial Concerns; Standards, Their Relation to Organization and to Results; The Realization of Standards in Practice; The Modern Theory of Cost Accounting; The Location and Elimination of Wastes; The Efficiency System in Operation; Standard Times and Bonus; The Gospel of Efficiency. This volume is offered to the reader as an introduction to Mr. Emerson's work, "Twelve Principles of Efficiency," which has been published recently.

BUSINESS LITERATURE

Factory Mutual Insurance; The Arkwright Mutual Fire Insurance Co., Boston, Mass.

The conservation of resources has recently become a popular issue, but for years the Associated Factory Mutual Fire Insurance Companies have been conserving resources for many years on an extensive scale by reducing the fire hazard in manufacturing plants. The idea originated with the textile mills and later extended to other industries. The leading facts concerning this work have been compiled in a book recently published by the Arkwright Mutual Fire Insurance Company in commemoration of the 50th anniversary of the founding of the company. Beginning with an interesting historical sketch the subject is treated under the following heads: The Early Mills and Their Fire Protection—1835-1850; Growth of the Factory Mutual Idea—1850-1880; Perforated Pipe Sprinklers, Organization of the Arkwright Company, Experiences and Lessons; The Expansion of the Mutual System—1880-1910; Further Experiences, Automatic Sprinklers, Fire Pumps and Streams, The Inspection Department, The Factory Mutual Laboratories, Later Fires; Lessons from the Fire Loss Record; Business Organization—Sprinkler Insurance, Use and Occupancy Insurance, When a Loss Occurs, Legal Status, Stability; Arkwright Development and Influences. The book, which is freely illustrated, is not for sale, but is being distributed to the members of the Arkwright Mutual Fire Insurance Company, engineers, architects and others specially connected with fire prevention engineering. A folder which comes with the book has a chart showing the amount of insurance, which has increased from $9,000,000 in 1860 to $288,000,000 in 1912. During the same period the cost of a $100 insurance for one year has fallen from 33.7 cents in 1860 to 4 1/2 cents in 1911.

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Komo Steam Traps; The Linton Machine Co., 26 Cortlandt St., New York.

This is a catalogue containing an illustrated description of the Komo steam traps for the separation of the water of condensation from steam. Simplicity and reliability are the features claimed for this trap which is built to operate under any pressure up to 250 pounds. It is built in different sizes to suit various requirements.

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Cotton Chats; The Draper Co., Hopedale, Mass.

Beginning with January, Cotton Chats will appear with a slightly smaller page, the new size being 6 by 9 inches. This change is made in order that the publication will reach the readers in better condition and that it may be readily filed for reference.

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HANDKERCHIEFS WITH ALGOLE DYED BORDERS

The Farbenfabriken Co., 117 Hudson St., New York, have issued a color card showing their new Algole colors. They also send a sample handkerchief with border dyed with these colors, which are very fast to light, washing and chlorine.

Industrial Notes

THE EASTMAN PLANT AT BUFFALO

Visitors to the large new factory of the Eastman Machine Co., at Buffalo, N. Y., often express surprise that such a large plant should be used entirely for the manufacture of cutting machinery, but in the sixteen years that this concern has been in business they have adapted their machines to every line of textile work where goods can be cut in quantities, and have a great demand for them.

The company has offices in all the manufacturing centers and at each office there are competent mechanics and expert operators, as well as a full stock of machines. As an illustration of the service given and the convenient location of these offices, the company claims that there is no manufacturer in the entire United States who by telegraphing to the nearest office that he is in trouble cannot have a machine to replace his by the next morning. Unlimited pains in the construction of their machines and careful study of service to the manufacturer has built up a big business that requires this big plant.

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LIGHTNING CHECKMATED

Striking a conveyor pipe through which cotton is fed from the picker to the cards in the Chatham Manufacturing Co., Winston-Salem, N. C., lightning started a fire. The pipes are connected with large bins at the rear of the carding machines. At the time of the fire these bins were about half filled with loose wool and cotton, oiled and ready for working. Six automatic sprinklers operated promptly, and completely extinguished the blaze without any assistance. The loss amounted to $136.

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RECENT "TURBO" CONTRACTS

Among the contracts recently closed by The G. M. Parks Co., for Turbo humidifier installations, are the following: Manhasset Mfg. Co., Putnam, Conn.; the Pepperell Mfg. Co., Biddeford, Me., for their new weave shed; the Androscoggin Mills, Lewiston, Me., for their bag mills and two floors of main mill; Sherman Mfg. Co., Sherman, Texas.

These orders have all come in during the past two or three weeks and aggregate a total of between 900 and 1,000 Turbo humidifier heads. The order from the Pepperell Mfg. Co. is the third order for Turbo humidifier installations from this concern, and on this installation the Turbo ring construction will be used.

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LEIGHTON MACHINE COMPANY SWEATER MACHINES

The Leighton Machine Company, Manchester, N. H., are very busy building sweater machines, having received a large number of orders as a result of the fact that the U. S. Government has

specified that sweaters of the seamless sleeve type must be used by the army. Sweater manufacturers recognizing the excellence of the Leighton Machine and its special adaptability to this work are in consequence keeping this company very busy.

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LA GRANGE EXTENSIONS

The La Grange Mills, La Grange, Ga., have recently added to their present group of mill buildings an opening room and waste house, one story high, 92 by 85 ft. The machinery in the opening room is to be driven by rope drive from the main mill and consists of the following equipment furnished by the Kitson Machine Shop:

One bale breaker feeder,
One 5-cylinder waste machine,
One 2-cylinder waste machine,
Four automatic feeders.

Under the direction of the same engineers a rearrangement has been made of the machinery in the main mill. This necessitated the installation of one breaker picker, two intermediate pickers, and one finisher of the Kitson Machine Shop make and the following machines manufactured by Saco & Pettee:

36 40-in. cards,
28 1st delivery drawing frames,
28 2d delivery drawing frames,
2 slubbers of 76 spindles each,
8 intermediates of 96 spindles each,
24 ring frames of 192 spindles each.

The fire protection system has been revamped and the supply of the new equipment is from a 50,000-gallon tank.

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THE LUNKENHEIMER CAST STEEL VALVES

Superheated and high steam pressures have created a demand for valves of greater strength and durability. In order to meet this requirement the Lunkenheimer Co., Cincinnati, O., have designed a complete line of globe, angle cross, gate, check and non-return boiler stop valves made of cast steel. These valves have proved their merits in actual use and are now giving satisfaction in a large number of establishments. The Lunkenheimer cast steel valves are annealed, which relieves all internal stresses, making a fair crystalline structure, which is very essential to strong steel. The Lunkenheimer Company state that the valves meet fully the specifications of the American Society for Testing Materials and that they contain less than one-half per cent. of either phosphorus or sulphur. The tensile strength of Lunkenheimer cast steel is about 80,000 pounds per square inch with a safe elastic limit.

For various pressures and degrees of superheat and to meet the requirements of engineers who differ as to the material used, Lunkenheimer cast steel valves are made in two combinations of material as regards the trimmings. For lower pressures and degrees of superheat, the company manufacture a large and complete line of cast iron and "pudled" semi-steel valves.

CYLINDER BUSINESS BOOMING

One of our representatives had occasion recently to call at the plant of Charles E. Sandberg, 65 Thomas St., Worcester, Mass., the tin and copper cylinder manufacturer who succeeded J. H. Whittall in this line, and who also manufactures drying cans, card screens, etc. We found the plant exceedingly busy, and Mr. Sandberg states that plenty of orders are in hand for future delivery.

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THE OTTO GAS ENGINE WORKS

H. R. Setz, who has been chief engineer of the Struthers Wells Co. of Warren, Pa., for the last two years, has just accepted the position of chief engineer with the Otto Gas Engine Works of Philadelphia. Mr. Setz was formerly connected with several of the leading American and European gas and oil engine manufacturers. His particular attention will be directed toward the development of a complete line of Otto Diesel engines of the horizontal type.

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AN ATTRACTIVE CALENDAR

A new calendar which the Stafford Co. of Readville, Mass., is sending out attracts special attention, not only for its artistic design, but also because of the photograph of the weave room of the Maverick Mills at East Boston, which is equipped with 1,000 "Ideal" automatic looms running on fine goods. This weave room is of the most modern construction. The perspective of the view is remarkably good, showing what appears to be an almost endless vista of looms.

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THE ARABOL MFG. CO.

Soluble softening oil, made by The Arabol Mfg. Co., New York, is recommended as a softener for cotton goods. Among the claims for this product are the following: It is easy to handle, reliable and not influenced by temperature. It gives a smooth finish to the warps, the threads divide well in the lease rods and the cylinders of the slasher remain clean. It is specially suited for strong and closely woven goods, such as corduroys, velveteens, sateens, twills, umbrella goods, cambric warps, etc.

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DIXON'S SILICA-GRAPHITE PAINT

The Joseph Dixon Crucible Company, Jersey City, N. J., are calling attention to the merits of their Silica-Graphite paint, in which the only oil used is pure, boiled linseed. The silica ingredient imparts to the paint a persistent cling and resistance to abrasion. It is especially recommended for its resistance to gases, brine, acids, ice, damp, heat and cold. Although slightly higher in price than the ordinary paints, the Dixon Company claim that it is more economical because of longer service. They have been manufacturing this paint in one quality for nearly fifty years. It is in use in all parts of the world, on railroad work, bridges,

buildings, pipes of all sorts, fences, gas tanks, water towers, trolley poles and trucks, roofs, steel cars and wherever there is danger of corrosion.

CONCRETE RESULTS OF SPRINKLER PROTECTION

An interesting statement appears in the annual report of the Boston Manufacturers' Mutual Fire Insurance Co. regarding the effect of automatic sprinkler protection in reducing fire losses. Briefly, the report is as follows:

During twenty-five years from 1850 to 1875, the loss per $100 of insurance written averaged 25.28 cents. During this interval, automatic sprinklers were entirely unknown. In the following twenty years—1875 to 1895 inclusive—sprinklers were being introduced, and about the end of this period the greater part of the properties insured by this company were protected by sprinklers. In this period of gradual sprinkler introduction, the loss ratio averaged 18.1 cents. During the sixteen years from 1896 to 1911 inclusive, in which the plants were all protected, and at the end of which most of the outbuildings were similarly equipped, the loss ratio was only 3.63 cents.

This shows a reduction, as compared with the first period, of more than 85 per cent. This result in itself would be sufficiently indicative of the manifest advantages of the use of automatic sprinklers, but when it is considered in the light of the actual conditions underlying the situation, the result is nothing short of marvelous. In the first place, it should be remembered that about the time the spirnklers began to be installed there was beginning to be felt a need for increased speed of machinry, and also for the use of manufacturing buildings of large area in order to simplify operations and take care of a very largely increased product. At the same time, volatile mineral oils were rapidly coming into use, displacing the vegetable oils previously used. All three of these elements of change added so much to the general fire hazard of mill operation as to have occasioned the statement by a man who has made a lifetime study of the subject, that without the automatic sprinkler, operation under the new condition in textile mills would have been absolutely impossible.

"GUARANTEED" NON-SHRINKABLE TAPE

Users of tapes will be pleased to note that they can secure a tape which the makers will guarantee to be "non-shrinkable." The makers state that this tape, which can be secured in numbers 17 to 35, is superior to ordinary linen or cotton tapes for the reason that it can be put into the garment without first shrinking the fabric and can be used from the spool direct. The Industrial Mills Co., of Jasper and Huntingdon Sts., Philadelphia, are putting this non-shrinkable tape on the market on spools of 1,000 yards. They will furnish samples and prices on request. They are also well known to the trade as manufacturing a line of cotton and mercerized narrow fabrics, stay bindings, plain and fancy spool tapes and plain glazed and mercerized braids.

C. BISCHOFF & COMPANY

The well known firm of C. Bischoff & Co., importers of dyestuffs and chemicals, at 451 Washington St., New York, have been appointed the sole American agents for the two German firms, R. Wedekind & Co., m. b. H., of Uerdingen, Germany, manufacturers of alizarine, chrome alum, etc., and Carl Jaeger, G. m. b. H., of Duesseldorf, Germany. Both are old established firms and will in a short time introduce to the American trade extensive lines of new coloring materials.

A NEW MACHINE SHOP

It will be of interest to manufacturers of hosiery and underwear and other classes of knitted fabrics to note that a new company, the Fidelity Machine & Manufacturing Co., have started a plant at 4015 Paul St., Frankford, Philadelphia, Pa., for the manufacture of cylinders and dials. The company has for its president John J. Higginbottom, a name which is well known to the knitting trade and which will lend confidence to anyone sending work of this class to be filled. Mr. Higginbottom having had long experience in the building of all classes of knitting machines, has fitted up the plant with the latest machinery with the result that they are able to turn out cylinders and dials of any dimension and at the earliest possible moment. The entire plant is under the personal management and supervision of Mr. Higginbottom, which gives assurance that the work will be done right. The company is also in a position to build special machinery and appliances for the manufacture of knit goods when occasion demands. They invite communications from manufacturers who may have anything in this line which requires prompt or quick attention.

"TSUMUGI"—A STRANGELY WOVEN CLOTH

Surely one of the most curiously prepared of all woven fabrics is the "tsumugi," one of the principal products of the little known Amane Oshima Isles, to the southwest of Japan. In the course of a report on a cruise among these and neighboring islands, Carleton Miller, the United States Vice-Consul at Nagasaki, describes the strange process of manufacture of this cloth, which it produced on a fairly large scale at Naze, the capital of the islands named.

Imported silk is first taken and twisted into rather heavy strands of several threads and then woven into a coarse cloth, cotton thread being used as a warp. This cloth is then put into the dyeing vats, the dye being obtained from a wood known as "tetsugi," for about 30 minutes. It is then dried in the sun and put back into the vats, this process being repeated about ten times. The cloth is next buried in the ground for seven or eight days (some say five or six years, but that is uncertain), which seems to fix the dye so that it does not run, as well as to rot the cotton warp. The silk strands are then torn from the rotted warp and rewoven. The undyed spots left where the cotton warp crossed the silk form the basis

for the different designs of the cloth.

The durability and sombre colors of the fabric appeal to the Japanese, and it is in great demand. About 100,000 tans of this cloth are woven annually in the vicinity of Naze, and sell for an average of about 31s. per tan. The best may be worth as high as £10 per tan. (A tan varies from 27 to 32 feet, averaging about 29 feet, and is from 14 to 16 inches in width.) The cloth is used chiefly for making kimonos and, lately, for fancy vests. The manufacture of the cloth is gradually passing from the homes to small factories.—The Textile Mercury.

DINNER TO PRESIDENT DIMICK

On March 22 the Southern New England Textile Club gave a dinner at the To Kalon Club, Pawtucket, R. I., to A. W. Dimick who has been president of the Club since its organization. When the repast was finished Henry C. Dexter presented to President Dimick a loving cup as an additional mark of the esteem in which he is held by the members of the organization. The cup is of beautiful design and solid silver and stands upon an ebony base at a height of 20 inches. Engraves upon it is the following: "Presented to A. W. Dimick, first President of the Southern New England Textile Club, March 22, 1912, by the Executive Committee: C. D. Robinson, H. C. Dexter, F. L. Chase, F. W. Howe, E. R. Richardson, A. Makepeace, R. Stewart, G. C. Hinckley, C. M. Holmes, G. P. Grant, Jr., G. E. Spofford." President Dimick has recently resigned as agent of the Fisher Mfg. Co., Fisherville, Mass., to accept a more responsible position as assistant treasurer of the Grosvenordale Co. His office and home are to be in Providence, R. I.

UNDERWEAR, SWEATERS AND GLOVES

Napier & Herrick of N. Y. City, well known selling agents of underwear and sweater coats, have been appointed sole selling agents for the products of Burns & Snow, Nashua, N. H., manufacturers of woolen and worsted gloves.

TASMANIA WOOL

From Consul Henry D. Baker, Hobart

The Agricultural and Stock Department of Tasmania has just issued a bulletin on the preparation of wool from the paddock to the salesroom. With regard to the scientific sorting of wool to command the attention of buyers it says:

"The times are changed from when growers of wool did not sort their clips. Bellies, locks, pieces were all rolled up regardless of daggs and dirt inside the valuable parts of the fleece, in a haphazard manner, perhaps by sheer good luck to meet a paying market. Experience has since taught the careful Tasmanian grower that sorting and classing wool is tantamount to an increased source of revenue, as the clips so treated command the attention and satisfaction of buyers; and the enhanced value of the wool is tangible proof to the owner that he has succeeded in acquiring the proper way in which to treat his wool clip.

"The shearing floor is the next stage to the sale floor. It is there that much damage is done to wool. This is the age of progression; the blade sheep shearers are giving place to machine shearers, as in turn the sickle passed away to be superseded by the reaper and binder. Machine shearing shortens the wool harvest, particularly when weather variations are in some seasons a delay and annoyance. There is no gainsaying the great advantage of machine over blade shearing; it is quicker, and in the case of wet seasons will enable the owner to have his wool in readiness to take advantage of the first favorable market, which on some occasions might make a great financial difference.

"Great care must be exercised with the packs, and the most careful owner will have them singed inside, and thus make them perfectly smooth. Each pack should be well looked over and turned inside out, then well shaken, so as to remove any remnants of jute, fringed ends, twine, or foreign matter that are adhering to the bale and likely to become disconnected therefrom and attached to the fleeces. The packs should be of good quality. After leaving the press the bales should be labeled in a clear, legible, and bold stencil on the top and on one of the opening sides, so as to assist the broker in stacking, and the particulars of the bales should be easily available for the brokers and buyers in their examinations.

"Growers would save expense to themselves by adopting the system now in vogue of sewing bales with colored twine, and thus greatly lessen the risk of cut ends of twine getting mixed with the wool. Colored twine is particularly recommended, as it is easy of detection.

"With the complete contrivances kept in stock for moving bales from rail to wool stores, the expedition in handling and elevating bales by mechanical appliances provided to lift and move bales into the showrooms reflects the greatest credit upon the energy of our established wool firms, both north and south of the State, in catering for the wool producer. The storing place for wool is strained to its utmost limit during the wool-sale season, and, as the wool has to be displayed to the greatest advantage of the seller and for the convenience and inspection of the buyer, every detail in this respect has been anticipated, studied, and adopted. The gentlemen who have attended our annual wool sales for many years past appreciate the facilities afforded them in their periodical visits for the purpose of securing Tasmanian wool, which, in our opinion, should rightly be secured in Tasmania. The encouraging facilities offered buyers are so apparent that their numbers and nationalities are causing their ranks to increase yearly, and new faces are to be seen—all in the interest of the producer, who is greatly benefited by the additional competition."

North Carolina, Flat Rock. The Flat Rock Hosiery Mill has been incorporated with capital stock of $125,000 by J. G. Scrutchin, Jr., C. P. Rogers, M. G. Starrett, E. H. Wells and F. S. Smith. Mr. Rogers is superintendent and buyer of the Skyland Hosiery Co., of Flat Rock.

Recent Textile Patents

BEARING, Spindle. 1,020,894. Thomas J. Fegley, Philadelphia, Pa.

CLOTH FINISHING Machine. 1,019,615. John B. Dunn, Woonsocket, R. I.

DYEING. 1,019,092. Maxim Schwarz, Braunau, Austria-Hungary.

DYEING and Bleaching Machine. 1,020,452. August Schiffers, Aix-la-Chapelle, Germany.

EMBROIDERY MACHINE. 1,020,663. Martin Henri, Rumpf, France.

EMBROIDERING MACHINE, Jacquard. 1,020,010. Robert Zahn, Plauen, Germany.

EMBROIDERING MACHINE, Shuttle. 1,020,674. Robert Zahn, Plauen, Germany.

FABRIC. 1,019,473. Alfred Hopkins, Chelsea, Mass.

FABRIC BORDER Forming Machine. 1,020,944. William H. Carter, Needham Heights, Mass.

FABRIC or Cloth. 1,020,499. Albert H. Henderson, Baltimore, Md.

FABRIC TREATING Apparatus, Cotton. 1,020,294. Stanislaw M. Krosnowski, St. Petersburg, Russia.

FABRICS, Treating. 1,019,909. Alexander T. Moore, New Orleans, La.

FIBERS into Threads of Silky Appearance, Converting Vegetable. 1,018,650. Jean M. Debourg, Lyon, France.

KNITTING MACHINE, Circular. 1,019,632. Emil Haaga, Stuttgart, Germany.

KNITTING MACHINE, Sectional Plating Device for Straight. 1,018,612. Paul Guenther, Dover, N. J.

LOOM. 1,020,664. Eppa H. Ryon, Worcester, Mass.

LOOM, Filling-replenishing Feeler. 1,019,279 Alonzo E. Rhoades, Leeds Point, N. J.

LOOM for Weaving Coir Mats and the Like. 1,019,625. William H. Forty, Kings Langley, England.

LOOM SHUTTLE Motion. 1,018,601. Hermann Baader, Gelterkinden, Switzerland.

LOOM PROTECTING Mechanism. 1,018,686. Henry Talks, Astoria, N. Y.

LOOMS with Mechanical Bobbin Change, Formation of the Thread-reserve for. 1,019,329. Adolf Marazzi, Kottern, Germany.

LOOMS, Automatic Filling Replenishing Mechanism for. 1,019,098. Edward S. Stimpson, Hopedale, Mass.

LOOMS, Warp Stop Motion for Pile Fabric. 1,019,026. Samuel B. Cutting and Edward Marshall, Bridgeport, Conn.

LOOMS, Thread Collecting Means for Automatic. 1,020,662. Alonzo E. Rhoades, Leeds Point, N. J.

LOOMS, Thread Cutting Mechanism for Automatic. 1,018,496. Denis M. Hollins, Blackburn, England.

LOOM, Automatic Filling Replenishing. 1,019,265. Henry Lussier, Salem, Mass.

LOOMS, Controlling Mechanism for Automatic Feeler. 1,020,622. Alonzo E. Rhoades, Leeds Point, N. J.

LOOMS, Yarn Tension for. 1,019,053. Livingston Knight, Leicester, Mass.

SHUTTLE EYE. 1,018,762. John H. Hopkinson, Fall River, Mass.

SHUTTLE GUARD. 1,019,405. Frank Johnson, New York City.

SPINNING and Doubling Frames, Thread Guide or Lapper for. 1,018,870. Norman Seddon Brown and James Hardacre, Wigan, England

SPINNING APPARATUS, Traverse-motion for Yarn. 1,020,713. Alonzo E. Rhoades, Leeds Point, N. J.

SPEED MECHANISM, Variable. 1,020,573. Jacob Ranz, St. Louis, Mo.

SPINNING, Doubling and Twisting Machine, Ring. 1,018,710. August Joegens, Kettwig, Germany.

SPOOL and Cutter, Combined. 1,018,945. Justin K. Toles, Berkeley, Cal.

SPINNING and Twisting Device, Yarn. 1,020,179. Victor Belanger, Marshfield, Mass.

APPLICATIONS FOR REGISTERED TRADE MARKS

These applications have been officially published by the U. S. Patent Office, so that any person who believes a registration would interfere with established rights, may have an opportunity to object within the specified time.

60,858. Cotton textile piece goods. Mark: Edelweiss. Owner: William A. Greer, Passaic, N. J.

54,483. Dress shirts, etc. Mark: Economy. Owner: Efroymson & Wolf, Indianapolis, Ind.

60,192. Cambrics, linens and muslins. Mark: P. R. Owner: M. P. Tuttle Co., Chadwicks, N. Y.

60,248. Cotton piece goods. Mark: Just Out. Owner: Fall River Bleachery, Fall River, Mass.

60,883. Cotton duck. Mark: Lakewood. Owner: Geo. B. Carpenter & Co., Chicago, Ill.

61,194. Hosiery. Mark: Vicuna. Owner: Baltimore Bargain House, Baltimore, Md.

56,726. Cotton and mercerized thread. Mark: Universal. Owner: Isaac J. Silverstein, New York.

59,876. Union suits of textile material. Mark: Rockinchair. Owner: Mark M. Henderson, New York.

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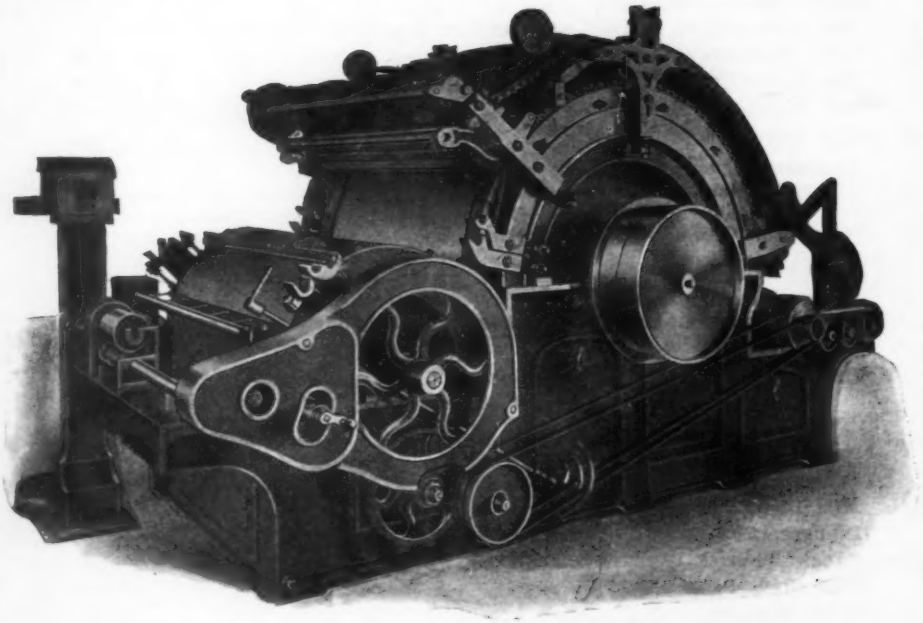
Correspondence

We solicit correspondence on textile subjects. Articles accepted will be paid for. Name and address must always be given, not necessarily for publication. Subscribers are invited to make free use of our Questions and Answers Department; correspondence is strictly confidential.

COTTON MACHINERY



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